Revised Report

Performance Evaluation of Phase II In Situ Enhanced Anaerobic Bioremediation Treatability Study

Signetics Site

Sunnyvale, California

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Reference:	27006-08-9016	Date:	5 August 2022

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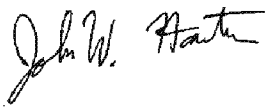

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List of Acronyms and Abbreviations

ACRONYM	DESCRIPTION
1,1-DCE	1,1-Dichloroethene
ASAOC	Administrative Settlement Agreement and Order on Consent
bgs	Below Ground Surface
CA	California
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cis-DCE	cis-1,2-Dichloroethene
CO_2	Carbon Dioxide
COC	Chemical of Concern
DHC	Dehalococcoides
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
DQO	Data Quality Objectives
DTSC	Department of Toxic Substances Control
DUP	Duplicate Sample
EAB	Enhanced Anaerobic Bioremediation
EPA	United States Environmental Protection Agency
ESTCP	Environmental Security Technology Certification Program

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Acronym	Description
EVO	Emulsified Vegetable Oil
Freon 113	1,1,2-trichlorotrifluoroethane; CFC 113
ft/day	Feet per Day
GAC	Granular Activated Carbon
gpm	Gallons per Minute
HASP	Site-Specific Health and Safety Plan
HLA	Harding Lawson Associates
in. H_2O	Inches of Water Column
In. Hg	Inches of Mercury
LEL	Lower Explosive Limit
MCL	Maximum Contaminant Level
µg/L	Micrograms per Liter
µm/s	Micrometers per Second
mg/L	Milligrams per Liter
mL/min	Milliliters per Minute
nM	nanoMolars (nmol/L)
NPDES	National Pollutant Discharge Elimination System
ORP	Oxidation-Reduction Potential

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Acronym	Description
PAIP	Pressure Activated Injection Probe
PCE	Tetrachloroethene
ppm	Parts per Million
PSI	Pounds per Square Inch
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RD/RA	Remedial Design/Remedial Action
REG	Regular (primary) sample
ROD	Record of Decision
ROI	Radius of Influence
RWQCB	Regional Water Quality Control Board
SRS-SD	Slow Release Substrate (SRS®) Small Droplet Emulsified Vegetable Oil Substrate
SOP	Standard Operating Procedure
SVE	Soil Vapor Extraction
TCE	Trichloroethene
TDIP	Top-down Injection Probe
TOC	Total Organic Carbon
TSI-DC	Terra Systems Inc. *Dehalococcoides mccartyi* Bioaugmentation Culture®

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Acronym	Description
UEL	Upper Explosive Limit
VOC	Volatile Organic Compound

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1 Introduction

This report provides an evaluation of the in situ enhanced anaerobic bioremediation (EAB) Phase II treatability study conducted at the former Signetics facility in Sunnyvale, CA (Site) for the period of September 2020 through November 2021. This evaluation report was prepared in accordance with the EPA-approved *Phase II Enhanced Anaerobic Bioremediation (EAB) Treatability Study Work Plan* (Locus Technologies, 2020) (Work Plan) dated 23 June 2020.

This report and its appendices demonstrate that post-injection monitoring field activities and data evaluations were conducted as outlined in the Work Plan. Field activities conducted in support of the injection time frame were documented in the *Injection Completion Report, Enhanced Anaerobic Bioremediation (EAB) Phase II Treatability Study* (Locus Technologies, 2021) (Injection Completion Report) dated 4 January 2021.

The Phase II treatability study goal is to complement and enhance the findings and recommendations presented in the EAB Study (Phase I) performed from November 2016 through December 2017. The overall objective of the treatability study is to evaluate the effectiveness of in situ enhanced anaerobic bioremediation of volatile organic compounds (VOCs) within the "A" aquifer at or near the Site source area for the enhancement of reductive dechlorination of chlorinated ethenes, specifically trichloroethene (TCE), as a potential treatment technology.

This evaluation report was prepared by Locus Technologies in response to the Administrative Settlement Agreement and Order on Consent (ASAOC) for the Site. The settlement was entered into voluntarily by Philips Semiconductors, Inc. (Philips) and the United States Environmental Protection Agency (EPA) with an effective date of 15 March 2019.

1.1 Site Background

The Site is located in Sunnyvale, California and is comprised of four contiguous parcels: two former semiconductor fabrication and testing facilities located at 811 East Arques Avenue (811

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Arques) and 440 North Wolfe Road (440 Wolfe), as presented in Figure 1, and two office buildings located at 815 and 830 Stewart Drive. The properties are no longer owned or operated by Philips. Past investigations at the Site have determined that groundwater is impacted with VOCs.

Chemicals of concern (COC) for the Site were established in the California Regional Water Quality Control Board (RWQCB) Order 91-104 (Order), adopted on 19 June 1999. Two additional chemicals were added in February 2020 by the EPA. The ten current chemicals of concern for this study are:

Chemicals of concern
Chloroform
1,1-dichloroethane (1,1 - DCA)
1,1-dichloroethene (1,1-DCE)
cis-1,2-dichloroethene (cis-DCE)
trans-1,2-dichloroethene (trans-DCE),
tetrachloroethene (PCE)
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)
1,1,1-trichloroethane (1,1,1-TCA)
trichloroethene (TCE)
vinyl chloride

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The principal constituent of concern is TCE, which, along with its daughter compounds, has been the focus of the Phase II study. Cleanup standards for these COCs were established in the 1991 *EPA Superfund Record of Decision* (ROD) (EPA, Environmental Protection Agency (EPA), Superfund Record of Decision: Signetics (Advanced Micro Devices 901)(TRW Microwave), First Remedial Action -Final, September, EPA/ROD/R09-91/074, 1991).

1.2 Site Hydrogeology

The aquifer system at the Site has been described in detail in the *Remedial Investigation Report* [Harding Lawson Associates (HLA) et al., 1991]. The subsurface has been divided into the "A" and "B" aquifer zones. The aquifers occur at the approximate depths listed in Table 1 and below.

Aquifer	Approximate Depth Below Ground Surface (bgs)
"A"	10 - 30
"B1"	30 - 50
"B2"	50 - 70
"B3"	70 - 90

Previous investigations at the Site have revealed that the aquifers have varying thicknesses and are frequently discontinuous. At some locations, more than one water-bearing unit may be present within an aquifer. There are also localized areas where aquifers coalesce. The "A" aquifer is generally more laterally continuous at the Site than the other aquifers (Emcon, 1984) and characterized by silty and clayey sand with thin, localized sandy and gravelly channel deposits. Boring logs of established monitoring and extraction wells within the treatment area in the "A" aquifer are presented in Appendix A of the Work Plan. Boring logs of the three new wells installed

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as part of the Phase II EAB Work Plan implementation are presented in Appendix A of the Injection Completion Report.

In 2005, excavated clean soil from the demolition of the 811 Arques facility was placed in the current bioremediation study area. This soil has created a mound of fill that is approximately six to nine feet (ft) above the grade of the remainder of the site. Thus, the aquifer depths in the bioremediation study area are approximately six to nine feet deeper than the values in the table above.

Regional groundwater flow in the "A" aquifer is generally northward at the Site. However, operating extraction wells, trenches, and sumps cause the groundwater flow direction to differ from this in the vicinity of the Site, as noted in the treatability study area where it flows northeast. "A" aquifer groundwater elevation contours for 2020 are presented in the *Annual Groundwater Report* (Locus Technologies, 2021) and have been integrated in Figure 2.

2 Purpose

The overall objective of the treatability study is to evaluate the effectiveness of in situ enhanced anaerobic bioremediation (EAB) of VOCs within the "A" aquifer at or near the site source area for the enhancement of reductive dechlorination of chlorinated ethenes as a remedial technology. A list of objectives was developed in Section 4.1 of the Work Plan (Locus Technologies, 2020) and are presented below.

- ◇ Improve the monitoring network by adding three additional monitoring wells in the treatability study area for baseline and progress monitoring; one additional well at the upgradient end of the treatability study area, and two additional wells at the downgradient end of the treatability study area.
- ◇ Collect injection pressure data at varying flow rates to refine injection procedures for future full-scale implementation.

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- Gauge water levels surrounding injection points to measure the radius of influence (ROI) of the injection.
- Increase carbon availability across the study area to decrease electron acceptor profile, mitigate VOC rebounds, and support the repopulation of inoculated microbial cultures.
- Increase Dehalococcoides (DHC) populations where populations have declined below the target of 1 x 10^6 cells/L (1 x 10^3 cells/mL) based on third quarter monitoring: S146A and S140A.
- Implement a gridded injection, expanding reactive zone to reduce the effects of boundary conditions (the effects of untreated areas on treated areas) and migration of VOCs to downgradient areas.
- Implement a gridded injection based on a 20-foot ROI, verified with field observations such as water levels or appearance.
- Determine the effectiveness of Slow Release Substrate (SRS®)- Small Droplet Emulsified Vegetable Oil Substrate (SRS-SD) and Terra Systems Inc. *Dehalococcoides mccartyi* Bioaugmentation Culture® (TSI-DC) bioaugmentation culture is effective at promoting anaerobic degradation of chlorinated ethenes and Freon-113 at S140A and S141A.
- Refine in situ remedial parameters for full-scale implementation.
- To demonstrate that injection of this substrate would not create unintended adverse impacts to groundwater.

The EAB system has been evaluated for effectiveness based on performance monitoring data collected over a period of twelve months. Per Section 4.6 of the Work Plan, evaluation of data is intended to determine:

- whether the data passed data quality criteria,

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- whether SRS-SD created a reducing geochemical environment and its co-application with TSI-DC induce biotic and abiotic anaerobic degradation of TCE to below baseline concentrations; and if so,
- optimal in situ parameters (such as substrate volumes, injection rates, number of applications, effective ROI) for use in developing a full-scale EAB program to remediate the impacted groundwater.
- Additionally, the data will inform the rate of formation and degradation of biodegradation daughter products and formation of non-toxic byproducts ethene and ethane.

Performance monitoring parameters to support the above objectives and determinations were developed in the Work Plan and evaluated based on performance expectations. Descriptions of specific parameters and how they are intended to be used and interpreted are shown in Table 3 and Table 7 of the Work Plan.

3 Summary of Field Activities

The following section summarizes Phase II EAB related activities at the Signetics site. The EAB injections were conducted in November 2020 followed by post-injection performance monitoring activities for one-year. A complete discussion of the injection field activities can be found in the Injection Completion Report (Locus Technologies, 2021).

Prior to the start of injections, a baseline groundwater monitoring event was conducted at the Site from 14-16 September 2020 to gather data necessary for assessing potential COC rebounding in the area of the Phase I injections and ultimately, for adjusting the substrate injection volumes and concentrations based on COC and geochemical conditions at the time of injections. To improve the monitoring network, three additional monitoring wells were installed via hollow stem auger on 3-4 September 2020: S158A, S159A, and S160A. These three A-aquifer wells were installed to provide supplemental information on the lateral extent of the injection ROIs as well as baseline groundwater conditions. S159A and S160A are located on the north end

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of the Phase II study area and one well S158A is located on the south end (see Figure 1). Using the results from the baseline monitoring event, substrate volume requirements originally proposed in the Work Plan were recalculated using the Environmental Security Technology Certification Program (ESTCP) Substrate Calculation Tool developed by Parsons (Parsons, 2010). Volumes were then adjusted for the SRS-SD substrate demand that requires a minimum of 500 milligrams/liter (mg/L) total organic carbon (TOC) (Locus Technologies, 2021). These design volumes were then further increased by approximately 50% at all injection locations to account for elevated sulfate concentrations. At two injection points, the SRS-SD and injection solution volumes were further increased, by 250% and 50%, respectively. Final injection quantities were documented by Cascade and discussed below.

3.1 Injection Implementation

A bioremediation injection solution consisting of emulsified vegetable oil (EVO), bioaugmentation culture, conditioned water, and sodium bicarbonate was injected into the subsurface soils and groundwater in the Phase II treatability study area (Figure 2). The EVO product implemented in this study was SRS-SD substrate and the bioaugmentation culture was TSI-DC.

After EPA-approval the Work Plan, field staff mobilized and began the pre-injection process. This started on 5 November 2020 with the conditioning of injection water to create an optimal anaerobic environment for the bacteria. To accomplish this, water was treated with sodium ascorbate in two 21,000-gallon water tanks and monitored periodically for decreasing dissolved oxygen (DO) and oxidation-reduction potential (ORP) values. The ideal target for the conditioned injection water was dissolved oxygen (DO) of 0.5 mg/L and a negative oxidation-reduction potential (ORP). Although the DO concentration was slightly above the target, based on the negative ORP and the asymptotic response to additional sodium ascorbate, it was determined that the conditioned injection water reached satisfactory levels of DO and ORP (0.92 mg/L and -147.7 ORP, respectively) on 10 November 2020. During onsite discussions with the substrate

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vendor and EPA, the consensus was that the DO was sufficiently low to proceed. The remainder of the injection solution was then mixed in tanks located on the injection platform. The injection solution consisted of SRS-SD substrate, conditioned water, sodium bicarbonate, and TSI-DC bioaugmentation culture in the quantities detailed in Table 1.

From 10-20 November 2020, twelve injections were conducted with a track-mounted direct push drill rig equipped with an injection platform. The first 5 feet of each injection borehole was advanced via hand auger to ensure underground utility clearance. The injection solution was prepared in a two-step process: SRS-SD, conditioned water, and sodium bicarbonate was first mixed in tanks located on the injection platform, then the TSI-DC culture was injected inline as the mixture was pumped to the drill rig at each injection location. The solution was injected via two methods (see Section 4.3.1), with injections administered every 2.5 feet for eight intervals, amounting in a total of 20 feet of injected substrate mixture at each location. Injections proceeded in the order seen in Table 1 at the locations seen in Figure 2. The following changes from the Work Plan design were noted:

- The highest SRS-SD concentration was injected at INJ-5 instead of the target INJ-1 because it was closer to the area of higher baseline TCE concentrations.
- At the last injection location, INJ-6, the SRS-SD concentration was increased to 140 gallons to use up remaining substrate conditioned water.
- The 150% dilution volume was ultimately injected at INJ-9 instead of the target INJ-12 because it was closer to higher baseline TCE concentration where an increased ROI could be beneficial.
- The initial injection depth was approximately 15 ft bgs, which was 5 ft deeper than the 10 ft bgs Work Plan specified depth. This was due to the presence of additional fill above grade as discussed in the Completion Report. The ending depth was also subsequently

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lower, at 35 ft bgs. When considering the fill, the aquitard depth is 36-39 ft bgs, therefore aquitard penetration is unlikely. The borehole was also grouted.

The contractor logged flow rates, pressures, and amendment ratios. Locus monitored back pressures and the visual presence of daylighting for each injection interval. Daylighting did not occur during the introduction of the materials. Injection delivery and monitoring field logs are included in Appendix A.

During injection activities, water levels were gauged simultaneously with well-dedicated sounders at well locations nearest to the concurrent injection point as another means to monitor potential daylighting. Groundwater elevations fluctuated at time of injections, indicating that injection point was hydrologically connected to the treatability area. Injection period groundwater levels are included in the Appendix A daily field activity logs and the plots seen in Appendix B. Monitoring wells in the Phase II study area were also sampled during the injection activities to assess the distribution of the substrate. Field parameters and laboratory results can be seen in Table 2 and Table 3, respectively.

Additionally, on the last day of injections, 20 November 2020, three borings (TW-1, TW-2, and TW-3) were advanced via direct push to roughly 13 ft-bgs to collect grab groundwater samples. These ad hoc samples were intended to bolster constraints on the baseline lateral extent of VOCs in the Phase II study area. Upon complete delivery of substrate at each injection point and the collection of grab samples at the exploratory borings, each boring was grouted with Portland cement and covered with native soil to restore each original surface. Upon complete delivery of substrate at each injection point, borings were grouted and covered with native soil. The area of activity was decommissioned, and waste removed within 24 hours following the last injection.

3.2 Post-Injection Monitoring

The Phase II study area was monitored post-injections to gather data for this performance evaluation. The post-injection data gathering process consisted of 1) sampling and monitoring

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groundwater from fourteen existing monitoring wells (S025A, S049A, S088A, S134A, S137A, S138A, S139A, S140A, S141A, S143A, S146A, S1598A, S159A, and S160A) (Figure 2) and 2) collection of vapor soil gas samples downgradient from treatability area (Figure 3) to ensure methane produced by the bioremediation process was not a hazard to nearby buildings and receptors. Field monitoring and sampling logs from each groundwater sampling event are included in Appendix C. Soil vapor well construction logs are included in Appendix C of the Phase I Evaluation Report (Locus Technologies, 2018), and sampling logs are shown in Appendix E. The series of field events conducted for post-injection monitoring were as follows:

- Month 1 Groundwater Monitoring: 15-18 December 2020
- Month 2 Groundwater Monitoring: 18-20 January 2021
- Month 3 Groundwater Monitoring: 15-17 February 2021
- Methane Soil Vapor Monitoring: 18-19 February 2021
- Methane Soil Vapor Monitoring: 17 March 2021
- Methane Soil Vapor Monitoring: 16 April 2021
- Quarter 2 Groundwater Monitoring: 17-19 May 2021
- Methane Soil Vapor Monitoring: 21 May 2021
- Methane Soil Vapor Monitoring: 21 June 2021
- Methane Soil Vapor Monitoring: 17 July 2021
- Methane Soil Vapor Monitoring Re-sample: 6 August 2021
- Quarter 3 Groundwater Monitoring: 17-19 August 2021
- Quarter 4 Groundwater Monitoring: 8-10 November 2021

3.2.1 Groundwater Monitoring

In order to validate the effectiveness of the EAB design following the injections, a groundwater monitoring plan was developed, which is outlined in Table 2 of the Work Plan for the Phase II Treatability Study (Locus Technologies, 2020). The monitoring plan was designed to provide

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sufficient data to evaluate the effectiveness of the study and to provide the necessary information to plan a full-scale implementation of the technology if the treatability study is successful.

3.2.1.1 Groundwater Sampling Procedures

Post-injection performance monitoring was conducted monthly for the first three months following the injection event, then quarterly for three additional sampling events. At each well, concentrations of off-gassed methane trapped within the well-headspace was measured and recorded with a RKI Eagle 2 portable gas detector. Water levels were gauged using an electronic water level indicator graduated to 0.01 feet, and then referenced to the top of the well casing elevation. Groundwater samples were collected using low flow purging and sampling methods described in the EPA's EQASOP-GW4 Standard Operating Procedure (SOP). At the time of purging, Hach field tests were used to gather arsenic, ferrous iron, and manganese groundwater samples at the well head to protect samples from exposure to oxygen. Post-injection monitoring field parameter results are compiled in Table 4.

Dedicated sample tubing was utilized at each well to lower the possibility of cross contamination. Equipment that was used at more than one sample location, however, was decontaminated prior to sampling a subsequent well using a standard 3-stage decontamination process.

3.2.1.2 Groundwater Analyses

Table 5 outlines the complete post-injection groundwater monitoring analysis schedule. Samples were analyzed for the following analytes using the test methods below, as established in the Work Plan (Locus Technologies, 2020):

- Alkalinity (SM 2320)
- Carbon Dioxide (RSK 175)
- Dehalococcoides (DHC)(QuantArray-chlor)
- Hydrogen (AM20GAX)

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- Manganese and Arsenic, Dissolved (EPA 200.7)
- Methane, Ethane, and Ethene (RSK 175)
- Nitrate and Sulfate (EPA 300.0)
- Sulfide (SM 4500)
- Total Organic Content (SM 5310C)
- Volatile Fatty Acids (AM23G)
- Volatile Organic Compounds (EPA 8620B)

Groundwater samples were submitted to Eurofins/Test America, Pleasanton, CA for all laboratory analyses, except for dissolved gases (RSK 175), metabolic acids (AM23G), hydrogen (AM20GAX), and DHC (QuantArray-chlor) analyses. Samples for the former three analyses were submitted to Pace Analytical in Baton Rouge, LA. DHC analyses were submitted to Microbial Insights, Inc. of Rockford, TN. All laboratories adhered to industry-standard QA/QC procedures when completing analyses. Post-injection monitoring laboratory results are compiled in Table 6 and laboratory results are in Appendix D.

3.2.1.3 Groundwater QA/QC Samples

Sampling was performed according to test method procedures and the appropriate Quality Assurance/Quality Control (QA/QC) measures, all of which are established in the *Quality Assurance Project Plan (QAPP) for Enhanced Anaerobic Bioremediation Treatability Study - Phase II* (Locus Technologies, 2020). This included collecting one field blank sample per each event to verify sample integrity during sample collection procedures. Similarly, one set of trip blank samples were sent to the lab with the regular field samples on each sampling day. Trip blank samples were analyzed for VOCs to ensure that any compounds detected in the sample were not the result of contamination during the handling and sampling process used for the samples prior to analysis. Lastly, one field duplicate sample was collected per each sampling event using laboratory-certified blank water. Results of the QA/QC samples are discussed in Section 4.1.

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3.2.2 Soil Vapor Monitoring

3.2.2.1 Methane Monitoring Criteria

While increased methane concentrations in groundwater and well-head vapor would most likely indicate favorable subsurface conditions for anaerobic biological activity, excessive methane concentrations could potentially pose both a fire hazard and a hazard to field personnel and nearby other receptors. Specifically, methane is explosive when present in concentrations between its lower explosive limit (LEL) of 50,000 parts per million (ppm) and its upper explosive limit (UEL) of 150,000 ppm (NIOSH, 2007). In the QAPP, specific methane concentration criteria for both groundwater and well-head vapor were identified that correspond to an action or set of actions. The primary response to elevated methane concentrations in well-head vapor and groundwater is to continue monitoring methane at the frequency of groundwater sampling. However, when well-head methane concentrations exceeded 10% of its LEL (5,000 ppm) and methane in groundwater exceeds 10 mg/L in the same well, the QAPP states that soil vapor would be sampled at three previously installed dual-nested soil vapor implants placed adjacent to the surrounding commercial buildings (Figure 3). The action criteria from the QAPP are outlined in the table below.

Methane Concentration Criteria	Action
<10% LEL (5,000 ppm) in well-head vapor AND >10 mg/L in groundwater	• Continue monitoring well-head vapor at the frequency of groundwater sampling or higher (i.e. monthly or biweekly) depending on groundwater (IDEM, 2019).

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Methane Concentration Criteria	Action
>10% LEL (5,000 ppm) in well-head vapor AND >10 mg/L in groundwater	• Soil gas monitoring points near receptors shall be sampled • Continue monitoring well-head vapor at the frequency of groundwater sampling or higher (i.e. monthly or biweekly) depending on groundwater and well-head results (IDEM, 2019).
>25% LEL (12,500 ppm) in well-head vapor AND >10 mg/L in groundwater	• When above ground structures, preferential pathways and subsurface structures are not present, venting would usually be an appropriate mitigation measure unless concentrations are extremely high site-wide (IDEM, 2019). • Continue monitoring at a monthly frequency or higher, depending on well-head results.

3.2.2.2 Criteria Exceedances

During the second and third monthly (18-20 January 2021 and 15-17 February 2021, respectively) groundwater sampling event, wells S137A and 139A both recorded well-head methane vapor concentrations exceeding 5,000 ppm and methane concentrations in groundwater greater than 10 mg/l. In response, monthly samples were collected from the vapor wells between February and August 2021, until the action triggering criteria were no longer met.

3.2.2.3 Soil Vapor Sampling Procedures

Soil vapor sampling equipment and procedures were selected in accordance with the 2015 California Department of Toxic Substances Control (DTSC) and RWQCB Advisory Active Soil Gas Investigations guidance (DTSC, 2015).

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3.2.2.4 Shut-In Test

Prior to sampling each soil vapor well, a quantitative shut-in test was conducted on each new sample train. The shut-in test involved applying a minimum vacuum of 100 inches of water column (In. H_2O) to the sample train with a vacuum pump to evacuate the lines. A shut-off valve to the vacuum pump was then closed and the sample train remained under vacuum for approximately five minutes to assess whether there was any loss of vacuum. If there was any observable loss of vacuum, the fittings on the sample train were then adjusted until the vacuum in the sample train did not noticeably dissipate. If the sample manifold would not hold vacuum after this adjustment, the sample manifold was discarded for a new one. After the shut-in test was successfully completed, the result was recorded on field sampling forms and the sampling train was not altered until the sample was collected. The field forms for soil vapor sampling events are included in Appendix E.

3.2.2.5 Sample Collection

Each vapor point was purged 3 case volumes using a vacuum pump, regulated to a flow rate of 150 milliliters per minute (mL/min). A new flow regulator was used for the collection of each new sample to avoid cross contamination. Purge volumes were calculated using standard methods that account for the borehole diameter, well construction material porosity, and the tubing diameter and length. Both purging and sampling occurred within a tracer gas shroud held to an ambient concentration of at least 10 percent helium to check for communication between the surface air and vapors at depth. Both in-line helium and ambient helium in the shroud were measured using standard helium gas detectors. At regular intervals during purge and sample collection, in-line helium and shroud helium concentrations in addition to well-side and canister vacuum pressures were recorded (Appendix E).

After purging, all samples were collected into passivated 1.4-liter stainless steel Summa canisters at the same flow rate of 150 mL/min. Once the canister vacuum gauges reached between 5 and

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2 inches of mercury (In. Hg), the sample was collected, and the canister valve was closed. The canister's final vacuum reading was noted on field sampling forms and on the chain-of-custody to document sample integrity (Appendix E). Additionally, methane was measured and recorded with a RKI Eagle 2 portable gas detector at each soil vapor well where a sample was collected.

3.2.2.6 Soil Vapor QA/QC Samples

At least one co-located duplicate sample was collected during each sampling day. The replicate samples were intended to evaluate analytical variability between samples. These field duplicate samples were obtained over the same time interval as the original sample and were sampled according to the same procedures previously described. Additionally, at least one field blank sample was obtained during each sampling day, using pure nitrogen gas as the blank gas. The field blank results were intended to verify sample integrity during the process of field sample collection.

The soil vapor samples were delivered directly to the laboratory following field activities. All samples were analyzed for methane and helium using method ASTM D-1946 for fixed gases. Sample analysis was conducted by Enthalpy Analytical in Orange, CA.

3.3 Deviations

The following were notable deviations from the activities described in the EAB Phase II Work Plan:

- During the Month 1 event, samples were not analyzed for arsenic and manganese by EPA 200.7. During these events, arsenic and manganese were measured using field measurement HACH kits. The 2020 Work Plan specifies that either the field kits or EPA 200.7 analysis may be used for determining concentrations of these metals. In subsequent events, lab analysis was elected in order to achieve lower reporting limits.
- During the Month 2 and Month 3 events, samples were analyzed for total recoverable arsenic and manganese by EPA 200.7, instead of dissolved arsenic and manganese EPA

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200.7. This occurred due to a miscommunication with the lab regarding the required metals analysis.

- ◇ During the Month 3 event, Test America sub-contracted analyses to McCampbell Analytical, Inc, which performed Nitrate as N and Sulfate analyses by Method 300.1, instead of Method 300.0.

After each monitoring event and upon review of sample results, sampling teams coordinated with laboratories to avoid future deviations. This required scheduling sampling events earlier in the week to avoid shipping delays over weekends, communicating the Work Plan requirements to laboratory staff and managers, and switching shipping carriers. For a complete analysis of the degree to which the work performed for the entire EAB Phase II study complied with specifications from the Work Plan and the QAPP, refer to Appendix G.

4 EAB Performance Results and Discussion

4.1 Data Quality Results

As discussed in Section 3.2.1.3, QA/QC measures were conducted each monitoring event during Phase II to determine the degree to which the work performed complied with specifications from the Work Plan and the QAPP. The Phase II QA/QC evaluation shown in Appendix G examines QA/QC results and procedures in terms of the five data quality objectives established in Section 2.5 of the QAPP: accuracy, precision, completeness, representativeness, and comparability (Locus Technologies, 2020). All Phase II field measurements and laboratory results underwent a quality control evaluation available in Appendix G. Laboratory QA/QC procedures and/or results that do not meet performance criteria are discussed in Appendix G and have been integrated in the Section 4 discussion, as needed.

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4.2 Baseline TCE Conditions

A baseline groundwater monitoring event was conducted at the Site from 14-16 September 2020. The results of this sampling effort were used to characterize initial groundwater conditions and determine appropriate concentrations and volumes of bioremediation injectate to use at each injection boring. At the time of the injection field activities, three exploratory borings were installed to roughly 13 ft-bgs and grab groundwater samples were collected from each. Since TCE is the principal COC at the Site, TCE results from these sampling efforts were used to approximately constrain the lateral extent of VOC contamination within and around the Phase II study area prior to implementing the treatability study. Baseline results were originally reported in the Completion Report.

Baseline TCE contours are presented in Figure 4. Baseline concentrations of TCE in the Phase II study area ranged from 17 to 15,000 µg/L at S137A and S140A, respectively. The highest concentrations of TCE are clustered towards the center of the Phase II study area, as delineated by the 10,000 µg/L contour which encompasses S140A and extends slightly eastward towards S158A, S146A, and S138A. The 1,000 µg/L contour is bounded by S159A to the north, S143A to the west, TW-1 to the south, and nearly 15 feet past S146A to the east. Following the general shape of the 1,000 µg/L contour, the 100 µg/L contour is bounded by S049A to the north, S144A to the west, roughly 20 feet past TW-1 to the south, and TW-3 to the west. Baseline concentrations of other constituents are further discussed in Section 4.5.

4.2.1 Well Groupings

Of the fourteen groundwater monitoring locations included in Phase II, ten wells are located inside the reactive zone, which is defined as the area influenced by the ROI of the injections, roughly the Phase II treatability study area seen in Figure 2. These ten wells within the reactive zone have been grouped into three regions to better characterize geospatial trends of the expanded

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treatability study area. Groundwater wells are grouped in terms of relative baseline TCE concentrations:

1. Low - TCE wells: S137A, S139A and S159A.

   Groundwater wells S137A, S139A and S159A are located in the north and northeast region of the reactive zone. Phase II baseline TCE concentrations at these locations range from 17 µg/L to 140 µg/L, refer to Figure 4.

2. The mid-range TCE wells: S141A, S143A and S160A.

   Groundwater wells S141A, S143A and S160A are in the northwest region of the reactive zone. Phase II baseline TCE concentrations ranged from 500 µg/L to 1,400 µg/L.

3. The high-TCE wells: S138A, S140A, S146A and S158A.

   Groundwater wells S138A, S140A, S146A and S158A exhibit the highest concentrations of TCE and are located in the southern half of the reactive zone. Baseline TCE concentrations ranged from 5,700 µg/L to 15,000 µg/L. The maximum Phase II baseline concentration of TCE was at well S140A at 15,000 µg/L.

Four wells are located outside of the reactive zone of the Phase II treatability study area. Wells S025A and S088A are 364 feet and 120 feet downgradient of the treatability study area, respectively, and are primarily monitored for adverse impacts, refer to Section 4.11. Well S049A is downgradient of the reactive zone and technically beyond the anticipated ROI of injections, but conditions at S049A may be impacted by the reactive zone due to its proximity downgradient (approximately 40 feet). Well S134A is the only upgradient monitoring well outside of the study area and represents background conditions for this study.

4.2.2 Radius of Influence

The Phase II treatability study injection activities were performed from 10 to 20 November 2020, consistent with the test goals in Section 4.1 of the Work Plan. The spacing of injection points was informed by the average ROI documented for the Phase I treatability study. In addition to injection

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grid expansion, one of the goals of the injection strategy was to confirm the design ROI using groundwater elevation measurements. A summary of results is presented in the sections below.

4.2.3 Radius of Influence Based on Groundwater Elevations

The principle goal for measuring the ROI in this phase of the study was to confirm the observed 20-foot lateral distribution of reagents, thus confirm the adequacy of injection point spacing for future EAB implementation. Injections were delivered over a twelve-point injection grid, spaced 20 feet trilaterally (Figure 5). The ROI for each injection was the resulting distance between the injection point and farthest monitoring well in which mounding of a minimum of 0.5 feet above baseline was measured. In instances when injection activities were commenced in the later hours of the day and completed on the following morning, only groundwater levels from the second day were evaluated for the ROI. This eliminated influences from residual flows of preceding injection activities as groundwater levels attenuated overnight. Groundwater levels monitored for each injection point are shown in Appendix B. ROI evaluation results are summarized below:

ROI Distance	No. Observations
<20 feet	3
20-29 feet	2
30-39 feet	6
>40 feet	1

The influence of delivered injection fluids were monitored using previously installed monitoring wells. Generally, three to four monitoring wells were selected per injection point for mounding observations and to confirm target ROI. When feasible, a minimum of one monitoring well within 20 to 30 feet from injection point was selected. Otherwise, injection monitoring distance was dictated by the location of monitoring well closest to injection point. The selected monitoring wells for each injection location are listed in Table 1 (see daylighting monitoring wells).

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A change in elevation of at least 0.5 feet was observed at distances below 20 feet for three injection locations 8, 9, and 10 (Appendix B Figure B-2, B-9, and B-4, respectively). Monitoring of groundwater level for these injection locations was not feasible at distances within 20-30 feet due to existing well configuration. As a result, response to injection delivery was measurable only at nearest monitoring distances between 12 to 15 feet. Injection influences monitored within and outside the 20-30 feet distance range, measurable mounding was observed at 20 feet or greater. A maximum groundwater elevation of 42 feet was observed during injection 11. However, this flow response may have been influenced by preceding injection activities completed on same day (Figure B-13).

To obtain a realistic ROI for this study, the arithmetic average calculation excluded monitoring data for injection location 8, 9, and 10 due to potential data gaps, and for injection 11 due to possible influence from residual flows. The resulting average ROI for this study was approximately 33 feet.

Note that the ROI based on groundwater elevations is not an accurate parameter for measuring the effective lateral distribution of reagents. Mounding effects may have been induced from the combination of lateral displacement of 10% of resident groundwater volume and injected reagent volume. Assuming minimal mixing between reagents and groundwater, the increase in groundwater elevation at distances greater than 20 feet may be influenced by the displaced unamended front or by residual flows from preceding injection activities in the vicinity. Therefore, a ROI of 20 - 30 feet should be retained for future implementations. Refinement of target ROI may be assisted with employment of tracer studies or similar methods to evaluate site specific fate and transport characteristics and preferential pathways within the treatability zone (Nelson et al, 2005).

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4.3 Delivery Techniques

Another test goal was to evaluate injection delivery techniques. This goal was achieved by evaluating direct push tool performance, injection pressure and flowrates at which daylighting and formation fracturing were not observed; and by documenting site-specific fluid volume acceptance capacity.

Prior to the beginning of injection activities, a pre-injection calibration test was conducted within the pilot area. The test consisted of the injection of 10 gallons of potable water at the INJ-3 injection location. The injection test was done to establish flow rates, pressures, and to check for leaks through the delivery system. Injection of remedial reagents was carried out with a Geoprobe 8030 track mounted direct push drill rig with push rod assembly.

Consistent with Section 4.2 of the Work Plan, pressures and flowrates were evaluated as follows: 1) evaluation of pressure data at flow rates between 10 to 25 gallons per minute, 2) evaluation of flow rate data at low pressure injections from gravity feed to 25 pounds per square inch (PSI). Fluid acceptance observations were made by evaluating backpressures during the delivery of 'test' injectate volumes. One test injectate consisted of SRS-SD at 250% above target volume and another of dilution water at 150% above target volume. Completed delivery parameters are seen in Table 1.

4.3.1 Pressure and Flowrate Delivery

The delivery of injection reagents was initiated with a 2.25-inch Pressure Activated Injection Probe (PAIP) (Geoprobe, 2013). This tool is designed with four horizontal injection ports that allows for the radial injection of reagents into the subsurface, in addition to a check valve to prevent back-flow. This injection tool was used at injection locations INJ-3 and INJ-8, which were the first injection points to be installed. The second tooling was a 2.25-inch x 2.5 feet top-down injection probe (TDIP). This tool uses injection ports spread out over the entire injection interval (2.5 feet). This tool was used in all injection points, except at locations INJ-3 and INJ-8. Initial

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and sustained pressures and average flowrates were monitored at the top of the delivery line at each of the eight intervals. Refer to Table 1 and the Completion Report Appendix E for the Cascade Injection Report.

Sustained pressures and flowrates for INJ-3 were estimated at 70-100 PSI and 3.8 - 20.2 gallons per minute (gpm). At a depth of 31-33.5 bgs, the injection was stopped due to clogging of the tool with clay material. The lowest flowrate (3.8 gpm) was measured at 33.5-36 bgs with a sustained pressure of 90 PSI. The resulting delivery rates were possibly due to the lower transmissive material located at lower depths and not a characteristic of tool performance. At INJ-8, observed pressures and flowrates were 150-170 PSI and 19.5-22.5 gpm, respectively. At this location, initial pressures were generally greater than the achieved sustained rate. At maximum, pressures differed by 50 PSI at the top two intervals. The slight decline in pressure from initial to sustained may indicate the localization of compacted soils that may have resulted from the advancement of the direct push tooling and not as an effect of fracturing (In Situ Remediation Reagents Working Group, 2009).

Injection location 6 (INJ-6) was used a test location to document pressure response to flowrates between approximately 10-25 gpm and flowrate response to low pressures between gravity feed and 25 PSI. The TDIP tool was employed for the injection of reagent at flowrates ranging from 10.1 gpm to 23 gpm. Flowrate adjustments were completed in a 'step up' fashion at interval transition. 'Respond' pressures increased from 45 PSI to 175 PSI with increasing flowrates. Based on system capacity and site conditions, a flowrate of 10.1 gpm and resulting pressure of 45 PSI were the lowest achievable delivery rates. Therefore, the evaluation of flowrate response to pressures between gravity feed rates and 25 PSI was not feasible. Daylighting was not observed during the injection process at highest flowrate and pressure; thus it is not recommended to continue the low pressure and flow evaluation in this treatability study area since the higher

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pressures used were not excessive, however for other areas and full-scale application this evaluation may still be necessary

4.3.2 Fluid Acceptance Capacity

Fluid acceptance capacity testing was conducted at INJ-5 and INJ-9. The injectate at INJ-5 consisted of SRS-SD emulsion at 250% above target rate, an equivalent injection volume of 593 gallons per interval or total injection volume of 4,744 gallons. The injectate prepared for INJ-9 consisted of an added 150% of dilution water, the equivalent of 862 gallons (50% above target) per interval or total injection volume of 6,989 gallons. Test volumes were delivered at sustained pressures of 170 PSI and at a maximum flow rate of 22.8 and 25 gpm at INJ-5 and INJ-9, respectively. No daylighting or pressure differential was observed.

The collection of pressure and flowrate data provided useful information on effectiveness of direct push injection tooling, sustainable delivery rates, and site-specific fluid acceptance capacity. Overall, the TDIP tooling provided flexibility in the field for delivering the reagent at various pressures and flowrates. General injection delivery rates were sustained at 170 PSI across the injection column and at flow rates of up to 26 gpm. Similar rates were observed for the delivery of loading volumes of up to 50% above design value. No daylighting or indication of fracturing was observed with the implemented injection techniques.

Observed delivery rates and TDIP tooling are recommended for future implementations, if other delivery parameters (i.e. injection depth, volumes, amendment material, etc.) remain the same. Further refinement of injection techniques may be accomplished by conducting closer inspection of backpressures; specifically, during pre, during, and post injection; to provide higher resolution on potential development of preferential pathways (In Situ Remediation Reagents Working Group, 2009). Additionally, the results of groundwater flow direction and velocity studies may be used to refine the injection layout design.

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4.4 Total Organic Carbon

TOC is an indicator of carbon availability at the site and is used to evaluate substrate distribution. TOC samples were collected consistent with the progress monitoring plan described in the Work Plan (Locus Technologies, 2020). Twelve injections were completed in a period of two weeks from 10 to 20 November 2020. Sample collection was completed at ten monitoring wells daily (to the extent practicable) during injection activities, monthly for first three months, and quarterly, thereafter. Table 6 includes TOC results from all Phase II sampling events, and a summary of TOC results is available in Table 10 along with other key redox parameters. General TOC retention time at monitoring wells is shown in Figure 6 and concentrations over time are presented in Appendix H (Figure H-1-0 through H-1-13). In addition, Figures 7a through 7g present estimated TOC concentration contours for the reactive zone, which show how TOC concentrations vary over time and space throughout the Phase II study period.

4.4.1 TOC Retention Time

The residence time of TOC within the treatment zone is a direct result of carbon utilization rate and site-specific advective flow. In EAB groundwater remedies, sufficient residence time is necessary to achieve complete degradation of chlorinated compounds. SRS-SD (carbon source) reagent injection volumes for the Phase II EAB pilot study were designed for a single application based on 1) baseline stoichiometric demand using the ER-200627 Loading Substrate Tool (Parsons, 2010) and 2) target dosing of 500 mg/L of TOC at the injection point. For this study, TOC was used as a surrogate for evaluating reagent distribution and longevity across the treatment zone over a period of 12 months (design cycle). Generally, TOC values above 20 mg/L are ideal to sustain biological degradation of VOCs (EPA, Bioremediation Anaerobic Bioremediation (Direct), 2021). The longevity of the reagent will elucidate the effectiveness of design dosage and reagent delivery frequency.

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4.4.1.1 Non- Reactive Zone TOC

Four wells were evaluated collectively as 'background' or non-reactive zone wells. Sample locations S025A and S088A are a set of distal downgradient wells designated for monitoring water quality impacts. Well S049A is located adjacent and downgradient of the treatment area, and S134A is a background reference well located upgradient (see Figure 2). The initial post injection sampling event in 15-18 December 2020 (Month 1) was completed 25 days following injection activities. Minimal change to TOC concentration was observed in the four background wells throughout the study period. The arithmetic average of baseline and post injection TOC was 1.90 mg/L and 2.15 mg/L (13% difference), respectively. No appreciable changes to TOC concentrations were observed following the first post-injection sampling event. Average TOC in the fourth quarter was estimated at 1.65 mg/L.

4.4.1.2 Reactive Zone TOC

TOC retention time was evaluated using data from monitoring wells within the Phase II reactive zone (treatability area), as shown in Figure 6. Following this approach, data from background wells were omitted. A summary of TOC across the treatment zone is presented below:

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Sampling Event	Avg. TOC (mg/L)	% Diff in avg TOC	Min (mg/L)	Max (mg/L)	No. locations with TOC ≥20 mg/L
14-16 September 2020 (Baseline)	1.9	--	1.0	2.4	--
10-13 November 2020 (Post injection – end week 1)	38	1900%	1.5	250	7
16-20 November 2020 (Post injection – end week 2)	120	210%	2.9	580	8
15-18 December 2020 (Month 1)	110	-8.0%	6.7	410	8
18-20 January 2021 (Month 2)	110	-5.0%	3.5	510	7
15-17 February 2021 (Month 3/Quarter 1)	79	-24%	1.2	460	6
17-19 May 2021 (Quarter 2)	28	-65%	2.3	150	3
17-19 August 2021 (Quarter 3)	34	20%	1.2	210	3
8-10 November 2021 (Quarter 4)	19	-43%	0.86	130	2

The highest TOC averaged 120 mg/L at the conclusion of injection activities (week 2). TOC tapered following this period, with greatest decrease (65%) occurring in transition to second quarter monitoring event 17-18 May 2021 (between 90 and 180 days). Progressive decline followed until the fourth quarter event in 8-10 November 2021 during which TOC levels ranged from 0.86 mg/L to 130 mg/L and averaged of 19 mg/L.

As seen in the above table, TOC levels above 20 mg/L were sustained at six out of ten monitoring locations through the Month 3 event on 15-17 February 2021 (90 days after injections/Q1). The number of locations with target levels was reduced to three by 17-18 May 2021 (day 180/Q2), and further reduced to two by end of pilot study 8-10 November 2021 (Q4). Target TOC levels were not achieved at well location S160A and poorly retained at S141A. These wells are located

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upgradient of the existing groundwater extraction trench. Although the extraction trench was not operated throughout the pilot, possible natural velocity gradients through the porous material of the trench may be attributing to poor retention of amendment at these locations. Additionally, rapidly decreasing TOC levels were observed at monitoring wells located immediately downgradient from injection points (S137A, S138A, and S159A). The evaluation of other lines of evidence may provide insightful data on whether the rapid decline may be attributed to microbial activity and or high advective flow. The approximate retention time over the course of the study period at each sample location is depicted in Figure 6.

The injection of SRS-SD resulted in a TOC increase from 1.8 mg/L to an average of 120 mg/L by end of second week of injections 16-20 November 2020. Average concentration gradually decreased following this period and with greater reduction by second quarter. Based solely on TOC data, the results suggest an increase in injection frequency or dosing concentration may be required for a 12-month design cycle. However, the depletion may be attributed to the effects of potential groundwater velocity gradients resulting from existing preferential pathways, in addition to its utilization for biotic degradation. Further refinement of amendment dosing and frequency may be assisted with the evaluation of biodegradation rates and from site-specific studies on groundwater velocity gradients across the treatment zone.

4.4.2 TOC Concentration Trends

Prior to Phase II injections, TOC concentrations were relatively constant across the sampling locations, both inside and outside the reactive zone, and ranged from 1 mg/L to 2.4 mg/L during baseline monitoring in 14-16 September 2020. However, injections created high variability in TOC concentrations across the study area. Figures 7a through 7g present estimated TOC concentration contours, which show changes in TOC concentrations over time and across the reactive zone. The first TOC concentration contour figure, Figures 7a, shows TOC results from samples collected approximately two weeks after injections on 20 November 2022, and the final

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TOC contour figure, Figure 7g, shows conditions at the time of the fourth quarter sampling event 8-11 November 2021. In general the highest TOC concentrations were first observed at the northeast side of the reactive zone, and the lowest concentrations were at the northwest side of the reactive zone (see Figure 7a). By the end of the performance period, the higher TOC concentrations appeared on the south side of the reactive zone (see Figure 7g).

All Phase II TOC results are also presented in time series plots in Appendix H (Figures H-1-0 through H-1-13). The Y-axes of these plots show TOC concentrations that range from either 0-250 mg/L or 0-600 mg/L for reactive zone wells (Figures H-1-4 through H-1-13), depending on the maximum TOC observed. The constant Y-axes aid in the visualization of TOC distribution and depletion over time. These plots identify injection start dates and the 20 mg/L TOC concentration threshold for sustaining biological degradation of VOCs (EPA, Bioremediation Anaerobic Bioremediation (Direct), 2021). Phase II TOC concentrations measured at the non-reactive zone wells are also plotted in Appendix H (Figures H-1-0 through H-1-3).

As shown in Appendix H time series plots, the injections in November 2020 caused TOC to increase to above 20 mg/L at every well inside the reactive zone, while the non-reactive zone wells did not surpass TOC concentrations over 3 mg/L through Phase II. The maximum TOC concertation of 580 mg/L was detected at well S159A on the final day of injections, 20 November 2020. Of the reactive zone wells, S141A and S160A recorded the lowest TOC concentrations and most rapid depletions, refer to Figures H-1-8 and H-1-13 in Appendix H, respectively. The depletion at S141A and S160A is also visible in Figure 7a, which shows how the TOC concentrations at these wells was already below the 20 mg/L threshold by the final day of injections, 20 November 2020.

In the reactive zone, TOC peaked during injections in November 2020, then steadily declined and approached baseline conditions by the fourth quarter. This is the case for wells S137A, S138A, S139A, S140A, S141A, S146A and S160A, as shown in Appendix H plots. There were a few

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exceptions. TOC concentrations at well S159A remained high through February 2021 (90 days after injections), shown in Figure 7d, before steady depletion. At well S143A, TOC was ideal until February 2021 (90 days after injections), then decreased to below 20 mg/L refer to Appendix H Figure H-1-9. Well S158A stabilized through the first quarter monitoring event in February 2021 at around 120 mg/L of TOC, increased during the second and third quarters, and finally decreased back down to 130 mg/L in the fourth quarter monitoring event in November 2021. By the fourth quarter monitoring event, only S158A was above the 20 mg/L TOC threshold, refer to Figure 7g. Wells S138A and S159A were just below the TOC threshold at 18 mg/L and 19 mg/L, respectively, in the fourth quarter.

Declining TOC levels in conjunction with elevated VOCs and the presence of alternate electron acceptors may indicate that additional substrate is required to sustain the anaerobic environment (EPA, Bioremediation Anaerobic Bioremediation (Direct), 2021). Within the Phase II study area, elevated concentrations of the alternate electron acceptor sulfate persisted, especially at wells S140A, S141A and S160A, refer to Table 10. As mentioned, these wells also had low TOC retention times. While preferential pathways and groundwater gradients may play a role in TOC depletion as discussed in Section 5.3, elevated sulfate in the study area (concentrations above 20 mg/L) may also contribute to depletions in TOC. Sulfate concentrations are discussed further in Section 4.6.5.

4.5 Volatile Organic Compounds (VOCs)

Section 1.1 discusses the ten COCs identified at the Signetics Site. Historical monitoring has shown TCE to be the predominant COC in the treatability study area, so TCE serves as the indicator chemical for the study. The aim of Phase II is to assess EAB as a viable technology for reducing COCs to acceptable concentrations. TCE concentrations are evaluated against the cleanup standard (action level) of 5 µg/L TCE, originally established in the ROD. Cleanup standards were determined for all COCs in the ROD, however the use of the standards in this EAB

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evaluation was limited to TCE and two daughter products, cis-DCE and vinyl chloride, with action levels of 6 µg/L and 0.5 µg/L, respectively. Concentrations of TCE and its daughter products were monitored throughout Phase II, and results are shown in the time series plots in Appendix H (Figures H-2-0 through H-2-27 show molar concentrations of VOCs; Figures H-3-0 through H-3-27 show VOC concentrations in units of micrograms per liter).

Besides TCE and its daughter products, the other prevalent COC at the study area is Freon 113. High concentrations of Freon 113 have been shown to cause stalling in the reductive dechlorination process. Freon 113 concentrations are discussed in Section 4.9. Refer to Appendix H for time series plots of Freon 113 relative to TCE and cis-DCE.

The other Signetics Site COCs are not included in this discussion because concentrations are relatively low compared to chlorinated ethene concentrations in the reactive zone; however, sample results are available in laboratory reports attached in Appendix F. For instance, chloroform was below detection at all locations during Phase II; chlorinated ethanes (1,1,1-TCA and 1,1-DCA) are found at orders of magnitude less than TCE and cis-DCE; and 1,1-DCE is a less common daughter product of TCE.

Phase II results are available in accompanying tables and appendices. Groundwater level measurements and field parameters are shown in Table 4. Analytical data for all wells are shown on Table 6. Temporal concentration plots are available in Appendix H. Associated analytical laboratory reports are included in Appendix D.

4.5.1 TCE Mass Removal

The change in mass of TCE as a result of Phase II injections can be calculated by comparing the baseline TCE mass to fourth quarter TCE mass. This method, shown in Table 8, estimates how many pounds of TCE were removed through a comparison of baseline and fourth quarter TCE analytical contours shown in Figure 4 and Figure 8, respectively. First, the area between each TCE contour (<100 µg/L, <1,000 µg/L etc.) is multiplied by an assumed saturated aquifer thickness

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of 20 feet and porosity of 0.36 (Locus Technologies, 2021), which converts each contour area into an "A" aquifer groundwater volume. Next, the geometric mean TCE concentration is calculated for wells located inside each contour area. The TCE mass is derived by multiplying each groundwater volume by each respective geometric mean TCE concentration. These calculations are performed for both baseline and fourth quarter TCE analytical contours, and total mass removed is calculated by subtracting the fourth quarter TCE mass from the baseline TCE mass.

Table 8 shows calculated values for baseline and fourth quarter TCE plume areas, geometric mean TCE concentrations, and the estimated TCE mass. Example calculations, conversion factors and assumptions are provided on page 2 of Table 8. This mass removal analysis estimates that the mass of TCE was approximately 19.0 pounds at the time of baseline monitoring in September 2020 and was reduced to 1.1 pounds at the time of fourth quarter monitoring in November 2021, which is a reduction of approximately 17.9 pounds (94% reduction) as a result of the Phase II pilot study. Figure 9 shows both baseline and fourth quarter TCE concentrations. The decrease in the area with higher concentrations indicate the TCE plume is shrinking in the treatability area.

4.5.2 Concentration Trends

The following sections discuss VOC concentration trends at the low, mid-range and high-TCE well groups within the reactive zone (see Section 4.2.1 Well Groupings). Plots showing these trends are included in Appendix H. Plots were made for each well in the standard reporting unit, µg/L as seen in Figure H-3-0 through H-3-13 (Appendix H). Plots were also converted to moles/liter to facilitate one-to-one comparison of the parent and dechlorination products as seen in Figures H-2-0 to H-2-13.

4.5.2.1 Low-TCE wells

Concentrations of TCE ranged from 17 µg/L to 140 µg/L at the low-TCE wells during the baseline monitoring event in September 2020 (refer to Figure 4). By the fourth quarter monitoring event

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in November 2021, TCE concentrations were reduced by 93%, 29%, and 99.8% at S137A, S139A and S159A, respectively, as seen in Table 9 (page 1). This section describes the degradative pathways and VOC concentration trends observed during Phase II.

Molar plots indicate that TCE decreased as a result of the injection at well S137A (INJ-2) and the dechlorination products were generated. Although not clear from the data, it is suspected that cis-DCE increased within the first 30 days, then decreased as expected in the VOC degradation process. Vinyl chloride peaked initially at 30 days, then decreased. Ethene increased until 60 days then stabilized. Both cis-DCE and vinyl chloride began rebounding after the second quarter or 180 days after injections. As mentioned earlier, the TOC retention time at this well was 90 days, indicating the ideal 20 mg/L TOC needed to sustain anaerobic treatment was not available. Additional substrate is likely needed in the area of this well to continue degradation.

The dechlorination product generation was less clear in well S139A. TCE decreased 30 days after injections at INJ-7 but then began rebounding. Cis-DCE and vinyl chloride exhibited a similar trend and rebounded after 30 days. Ethene was generated with a peak at 30 days. The TOC retention time at this well was 90 days, thus substrate was still available during the rebounding. Other factors besides substrate amount may be contributing to rebound at this well. Compared to the other low-TCE wells, S139A is located closer to the baseline 10,000 µg/L TCE area of the plume, shown in Figure 4. Rebounding that occurred at S139A may be influenced by groundwater transport of VOCs from higher concentrated areas of the plume. Sources of rebounding are discussed further in Section 4.5.3.

S159A exhibited an ideal parent and dechlorination daughter product trend. While TCE decreased in response to the injection at INJ-4, cis-DCE increased and reached its peak after 30 days at which point began to decrease. Vinyl chloride began to increase after injections and peaked around 60 days after injections before it decreased. Ethene was generated, peaked 90 days after injections, then decreased. Rebounding did not occur in this well. The TOC retention time was

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four quarters. COC concentrations decreases in this well are thus attributed to reductive dechlorination.

After injections, TCE concentrations at wells S137A and S139A decreased to below the action level of 5 µg/L after 30 days as seen in Table 9. Well S159A reached the TCE action level shortly thereafter (at 60 days <10 µg/L TCE; 90 days 1.6 µg/L TCE). For the remainder of Phase II, TCE was below the action level at wells S137A and S159A.

Concentrations of cis-DCE also dropped below the action level of 6 µg/L after 90 days at S137A and after two quarters (180 days) at S159A. Cis-DCE, however, began to rebound above the action level at S137A in the third quarter. Cis-DCE also rebounded in S139A after 90 days and resulted in a higher concentration than Phase II baseline and a return to the original Phase I concentration.

Vinyl chloride reached a maximum concentration 30-60 days after injections at the low-TCE wells. Vinyl chloride remained elevated at S137A and S139A, but decreased at S159A, meeting the action level in the fourth quarter. Well S159A was the only groundwater well in the reactive zone to achieve complete dechlorination during Phase II because all COC action levels met within the Phase II timeframe. The fourth quarter vinyl chloride concentrations in wells S137A and S139A were higher than the Phase I and Phase II baselines, indicating reductive dechlorination of TCE and cis-DCE is occurring to generate this daughter product, however additional substrate is needed to complete the degradation pathway.

4.5.2.2 Mid-range TCE wells

Baseline monitoring indicated the predominant COCs at the mid-range wells were TCE and cis-DCE. TCE concentrations in September 2020 ranged from 500 µg/L to 1,400 µg/L at the mid-range wells. By the fourth quarter of Phase II, TCE concentrations were reduced by 71%, 99.8% and 68% at S141A, S143A and S160A, respectively as seen in Table 9 (page 2). This section describes the degradative pathways and VOC concentration trends observed during Phase II. Final

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TCE contours for the treatability study area are shown in Figure 8, and plots showing TCE trends are included in Appendix H.

The molar and concentration plots for S141A, located at the north edge of injections, indicate TCE decreased as a result of the nearby injection (INJ-7), yet it rebounded after 90 days. Cis-DCE was generated and peaked after 30 days after which it decreased and returned to the original cis-DCE concentration. Vinyl chloride peaked after 60 days then slowly decreased yet remains above the baseline concentration. Ethene was generated and peaked after 60 days at which time it stabilized. The TOC retention time was days at this well, indicating that the ideal 20 mg/L TOC needed to sustain anaerobic treatment was not available. Additional substrate is likely needed in the area of this well to continue degradation.

Well S160A, located about 25 feet northeast of S141A, exhibited a TCE decrease then rebounded after 30 days. Cis-DCE did not peak as expected during the reductive dichlorination process, however it decreased throughout the performance time period. Vinyl chloride also did not peak as expected yet decreased and stabilized. Ethene was not generated in this well when compared to baseline, however the baseline concentration is unusually high when compared to other wells. Due to the lack of expected trends, sustained reductive dechlorination did not occur in this well. The TOC retention time was days, indicating that the nearby injection (INJ-7) had minor impact at S160A.

In well S143A, located on far west side of the Phase II treatability study area, TCE decreased as a result of injections at INJ-10 until 90 days after the injection, at which point TCE began a slight rebound. Cis-DCE increased and peaked 30 days after injections, then decreased until it rebounded after the third quarter (270 days post injection). Vinyl chloride also peaked 30 days after injections and rebounded after the third quarter. Ethene increased until 60 days after injections at which point it stabilized. The TOC retention time was nearly two quarters in this

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well, indicating that the ideal 20 mg/L TOC needed to sustain anaerobic treatment was not available. Additional substrate is likely needed in the area of this well to continue degradation.

Despite the lack of the ideal amount of TOC to sustain treatment in the mid-range TCE wells, there was an immediate response to injections. One month after injections, TCE concentrations decreased by 81.4%, 97.0%, and 98.0% at S141A, S143A and S160A, respectively (see Table 9 page 2). At well S141A, the minimum TCE concentration observed was 220 µg/L at the 90-day post-injection event. Cis-DCE at S141A initially increased after injections and decreased gradually during every monitoring event thereafter. After 60 days, vinyl chloride reached a maximum of 260 µg/L at well S141A and remained above baseline concentration through the fourth quarter. Action levels were not met for any COCs at S141A, however final concentrations in this well were lower than the Phase I baseline values for all COCs except TCE and Freon 113.

Well S143A met the action level goals for TCE and cis-DCE after 60 days but rebounded slightly in the fourth quarter (cis-DCE 24 µg/L; TCE 9.7 µg/L). Vinyl chloride peaked after 30 days and approached the action level between days 60 and 90, before rebounding in the fourth quarter. Ethene concentrations at S143A increased from below detection at baseline to 950 µg/L after 60 days. All final COC concentrations at this well were lower than Phase I baseline concentrations, except for vinyl chloride. Fourth quarter Phase II results are approaching action levels, except for vinyl chloride.

Due to elevated reporting limits (where sample dilution was needed to quantify cis-DCE), it is unclear if TCE action levels were ever reached at well S160A, although TCE concentrations approached action levels during two monitoring events (TCE <10 µg/L after 30 days; TCE <25 µg/L after 60 days). Cis-DCE concentrations were reduced by nearly 50% in Phase II but remained above action levels. Cis-DCE and TCE rebounded slightly in the fourth quarter. Well S160A had the highest baseline ethene concentration of all wells and vinyl chloride concentrations were much higher than other mid-range wells. However, concentrations of ethene and vinyl chloride

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decreased 30 days after injections and remained low through the fourth quarter. As discussed earlier, based on daughter product trends, these decreases are likely not due to reductive dechlorination.

4.5.2.3 High-TCE wells

During baseline monitoring, groundwater wells S138A, S140A, S146A and S158A had the highest concentrations of TCE, cis-DCE and Freon 113 of all the wells in the study area. These wells are located in the middle of the Phase II treatment area. Wells S138A, S140A, and S146A are also within the Phase I injection ROI. At the time of baseline sampling, cis-DCE was the predominant COC at the high-TCE wells, except at well S146A where the TCE concentration was slightly higher (5,700 µg/L TCE; 4,200 µg/L cis-DCE), which could be attributed to Phase I treatment efforts

Fourth quarter results show TCE was reduced from baseline concentrations by 99.9%, 98.7%, 28.1%, and 99.9% at S138A, S140A, S146A and S158A, respectively as seen in Table 9 (page 3). Well S146A (28.1% reduction from baseline to Q4) achieved 96.5% reduction 60 days after injections but rebounded to baseline levels by the fourth quarter sampling event. An explanation of VOC rebounds is described in Section 4.5.3. This section describes the degradative pathways and VOC concentration trends observed during Phase II. Plots showing these trends are included in Appendix H.

After TCE was reduced in well S138A following injections at INJ-5, cis-DCE decreased approximately 30 days post-injection as seen in the Appendix H plot (Figure H-3-5). It is suspected that the cis-DCE peak occurred within the first thirty days. Cis-DCE continued to decrease through 90 days (decrease of 92% from baseline) at which point it began to stall above action levels. Vinyl chloride began to increase after 30 days and peaked at 90 days post-injection (increase of 2,000% from baseline). After decreasing for two quarters, vinyl chloride rebounded slightly in the fourth quarter. Ethene exhibited an increasing trend through the post-injection monitoring process. By the fourth quarter, all COCs were above action levels at S138A, although

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the reporting limit for TCE was elevated (TCE result of non-detect <10 µg/L). While rebound occurred, these trends indicate reductive dechlorination is occurring at this well. The TOC retention time at this well was four quarters, indicating substrate is still available to sustain anaerobic treatment. Thus rebound is likely due to a factor other than lack of substrate. Further monitoring is also recommended to see if the remaining substrate may continue to aid in degradation.

TCE in well S140A decreased substantially in the first 30 days, rebounded then decreased again after 90 days post-injection. Cis-DCE was high in this well at the start of injections and slightly increased 60 days post-injection. Cis-DCE returned to near baseline by the end of the performance timeframe. Vinyl chloride increased after 30 days, decreased, then rebounded at 270 days. Ethene increased from baseline, slightly decreased, then resumed increasing. The nearby injection was INJ-8. TOC retention time at this wall was 60 days, indicating the ideal 20 mg/L TOC needed to sustain anaerobic treatment was not available. Additional substrate is likely needed in the area of this well to continue degradation.

TCE initially decreased in well S146A, then rebounded after 90 days post-injection (see Appendix H molar plot in Figure H-2-10). Cis-DCE increased and peaked after 60 days then decreased until the third quarter, after which it rebounded. Vinyl chloride increased and peaked during the second quarter (although the analysis was out of hold), then decreased before slightly rebounding after third quarter. Ethene did not appear to increase during the performance timeframe. The rebounding and lack of ethene generation indicate reductive dechlorination was limited. In addition, the TOC retention time at this well was two quarters, indicating the ideal 20 mg/L TOC needed to sustain anaerobic treatment was not available. Furthermore, the injection delivery tool used at the nearest upgradient injection point (INJ-3) was the PAIP instead of the TDIP used at other injection locations. Using this tool, sustained pressures and flowrates were limited at 70-100 PSI and 3.8 - 20.2 gpm with periodic tool clogging. Additional substrate will be needed in

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the area of this well to continue degradation, and it is recommended that the TDIP be used instead of the PAIP to ensure adequate injectate distribution.

Well S158A, located on the southern end of the Phase II treatability area and within the ROI of INJ-9, exhibited reductive dechlorination trends for much of the performance monitoring period (see Appendix H molar concentration plot in Figure H-2-11). TCE decreased until the third quarter after which it rebounded. Cis-DCE increased by 286% 30 days after injections, peaked 60 days after injections, then decreased to below baseline, however rebounded after the third quarter. Vinyl chloride increased until the second quarter, decreased, then rebounded after the third quarter as well. Ethene was generated in this well as a result of the reductive dechlorination process and stabilized after the second quarter. By the fourth quarter, all COCs were above action levels at S158A, although the reporting limit for TCE was elevated (TCE result of non-detect <10 µg/L). The TOC retention time in this well is four quarters and contained 210 mg/L TOC, substantially above the recommended amount. Because the rebound occurred in fourth quarter sampling event, further monitoring is recommended in this well to ensure these concentrations are not anomalous.

While rebounding occurred frequently in the high-TCE wells, TCE was readily reduced following injections. After 30 days, TCE decreased by 96%, 97%, 94% and 68% compared to baseline conditions at S138A, S140A, S146A and S158A, respectively. Cis-DCE remained high or increased after 30 days with concentrations ranging from 8,500 µg/L to 44,000 µg/L. High cis-DCE concentrations resulted in elevated reporting levels for VOCs other than cis-DCE during Phase II, especially for these high-TCE wells. This is due to sample matrix interference where analytes present at very high concentrations interfere with the laboratory's ability to accurately detect analytes present at very low concentrations (refer to Appendix G). Although the TCE action level may have been met during the first and fourth quarters (the reporting levels were elevated at 50 µg/L and 10 µg/L, respectively), the only result confirmed to meet the 5 µg/L action level was

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S158A in the third quarter when cis-DCE concentrations significantly decreased and TCE was detected at 2 µg/L.

As previously mentioned, cis-DCE stalled at S140A and S146A during Phase II, with final cis-DCE concentrations near or above baseline concentrations. In the Phase I evaluation report, stalling of cis-DCE degradation at S140A was linked to high Freon 113 concentrations (Locus Technologies, 2018). Freon 113 inhibits reductive dechlorination by DHC (specifically *Dehalococcoides mccartyi*) in a concentration-dependent manner, causing cis-DCE stalls (Im J, 2019). The relationship between concentrations of Freon 113 and stalling of cis-DCE degradation is discussed in the Freon Concentrations Section 4.9.

4.5.3 VOC Stalls and Rebounds

One of Phase II Work Plan Test Goals listed in Section 2 is to mitigate VOC rebounds by increasing the carbon availability across the study area. The VOC concentration trends reviewed in Section 4.5.2 identified instances of potential stalling and/or rebounding at monitoring locations in the treatability study area and attributed much of the rebounding to lack of substrate retention time. This section discusses additional potential reasons for VOC stalls and rebounds at EAB sites.

Stalling refers to concentrations of VOC that remain relatively constant over time. The reductive dechlorination process may stall, even under favorable reducing conditions, if concentrations of competing compounds are elevated. For example, during Phase I, high sulfate and Freon 113 were observed to cause potential stalling inside the reactive zone (Locus Technologies, 2018).

Studies have shown that stalling at cis-DCE and vinyl chloride can occur if elevated sulfate concentrations coexist with low TOC concentrations (EPA, Bioremediation Anaerobic Bioremediation (Direct), 2021). Stalling at cis-DCE may also result if Freon 113 concentrations are elevated. Studies show Freon 113 inhibits reductive dechlorination by DHC (specifically DHC *mccartyi)* in a concentration-dependent manner, causing cis-DCE stalls (Im J, 2019). Finally, stalling may also arise if reducing conditions are insufficient. Under mildly anaerobic conditions,

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vinyl chloride may accumulate at a faster rate than vinyl chloride is degraded, causing concentrations of VOCs to stabilize (Parsons, 2004).

Rebound is a post-treatment phenomenon that causes aqueous-phase VOC concentrations to increase following sharp declines in VOC concentrations. There are a few common causes of rebound. Rebounding caused by groundwater transport (advection) may cause a rebounding effect at downgradient wells, especially if the upgradient wells contain very high VOC concentrations comparatively (Air Force, 2007). Rebounding may also arise from diffusion of VOCs from high concentration areas to lower concentration areas. Also, rebounding of VOCs after initial improvement may be caused by matrix back-diffusion, which occurs when VOCs that adsorbed onto aquifer sediments or other constituents are later released back into the aqueous phase from diffusive forces (ITRC, 2020). At enhanced in-situ sites applying SRS-SD substrate, rebounding may appear due to a phenomenon called sequestration, in which VOCs in the groundwater partition into the substrate after injections, substantially reducing VOC concentrations in the aqueous state. As unpartitioned VOCs are degraded in the aqueous state, additional chlorinated solvent mass will be released from the substrate due to equilibrium partitioning, causing a rebound in VOC concentrations (Air Force, 2007).

4.6 Redox conditions

Reduced environments are characterized by diminished levels of dissolved oxygen (DO) and by strongly negative oxidation-reduction potential (ORP) values (EPA, 1998). In a groundwater environment with sufficient carbon substrate, native electron acceptors are reduced in the following sequence (from most readily reduced to only reduced in strongly reducing environments): nitrate, manganese, ferric iron, sulfate, then carbon dioxide (methanogenesis). Similarly, reductive dechlorination of ethenes and ethanes is promoted under reduced conditions. The more highly chlorinated (more oxidized) VOCs, such as PCE and TCE, tend to reduce more readily under anaerobic conditions, and the less-oxidized VOCs, such as cis-DCE and vinyl

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chloride, are already somewhat reduced and require more reduced conditions (EPA, Bioremediation Anaerobic Bioremediation (Direct), 2021). Insufficient redox conditions may lead to accumulations of these less-oxidized VOC, refer Section 4.5.3, which discusses cis-DCE and vinyl chloride stalls.

Monitoring electron acceptors and VOC species over time provides multiple lines of evidence necessary to evaluate the remedial effectiveness of EAB applications. Table 10 presents a summary of key redox species for ease of comparison over time at each monitoring well. Tables 4 and 6 include all post-injection groundwater quality monitoring data.

4.6.1 Oxidation Reduction Potential

The ORP of groundwater provides data on whether or not anaerobic conditions are present. This measurement alone is insufficient and must be used in conjunction with other geochemical parameters to express the extent of the reducing conditions in groundwater. In general, positive ORP values in conjunction with elevated DO and absence of substrate can indicate that additional substrate is required to promote reductive dechlorination by biodegradation. However, if ORP measurements are negative, the likelihood of reductive dechlorination can be estimated by the magnitude of the negative ORP measurement. For example, ORP less than -50 mV indicates reductive dechlorination is possible, ORP values less than -100 mV means dechlorination is likely, and ORP under -150 mV is ideal. Plots showing DO and ORP are available in Appendix H (Figures H-4-0 through H-4-13).

During the baseline monitoring event, ORP values ranged from +120.9 mV to -144.6 mV in the reactive zone. The only positive ORP measurements were detected in the mid-range TCE wells in the northwest region of the reactive zone (S141, S143A, and S160A). All other wells in the reactive zone had negative ORP values during baseline monitoring, with the high-TCE wells registering the most strongly negative ORPs. The ORP measurements decreased during the injection period from 10-20 November 2020 as seen in Table 2. After 30 days, ORP values ranged from -116.0

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mV to -310.2 mV in the reactive zone, indicating favorable reducing conditions for dechlorination. The most strongly negative ORP values were detected in the center of the treatability study area at the high-TCE wells.

All monitoring wells in the reactive zone remained below baseline ORP values through the final post-injection monitoring event in November 2021. However, two mid-range wells, S141A and S160A, had marginal ORP values in the fourth quarter (-70.7 mV and -55.7 mV, respectively). These mid-range wells also had the highest ORP values (least reducing) during baseline monitoring. The ORP values remained in the favorable range for dechlorination through the fourth quarter at the high-TCE and low-TCE wells (<-100mV ORP).

4.6.2 Dissolved Oxygen

The extent of reducing conditions in groundwater can be informed by DO measurements. DO must be depleted to less than 0.5 mg/L in the groundwater in order to establish a reductive dechlorination pathway (EPA, Bioremediation Anaerobic Bioremediation (Direct), 2021). Plots showing DO and ORP are available in Appendix H (Figures H-4-0 through H-4-13). Baseline monitoring from September 2020 confirmed that the subsurface of the reactive zone was at an anaerobic state (< 0.5 mg/L) prior to Phase II injections, except for one monitoring location that was slightly above the DO threshold (S143A at 0.7 mg/L). Up-gradient and down-gradient wells were also below the DO threshold, which is not expected outside the reactive zone, thus baseline DO measurements may not be representative.

During injections on 10-20 November 2020, DO temporarily increased within the reactive zone and immediately downgradient at S049A. DO concentrations returned to below 0.5mg/L at all monitoring locations in the reactive zone 30 days after injections, except for at two monitoring wells that were still slightly elevated (S141A 0.53 mg/L; S137A 0.57 mg/L). DO concentrations were below 0.5mg/L at all locations in the reactive zone during 60 days after injections, ranging

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from 0.22mg/L to 0.45mg/L, refer to the DO concentrations in the summary of redox conditions in Table 10.

Field technicians encountered an instrumentation error during the Month 3 monitoring event on 15-17 February 2021. DO was elevated at all monitoring locations in the reactive zone and ranged from 1.19 mg/L to 1.39 mg/L. Field technicians performed a re-sampling event the following month on 15-16 March 2021 using two YSI Pro-DSS meters arranged in parallel to collect replicate field measurements at all monitoring locations in the reactive zone. The resampling event confirmed DO in the reactive zone was not elevated (DO ranged from 0.37 mg/L to 0.54 mg/L). The DO probe in the YSI Pro-DSS is highly sensitive to salinity and temperature, and long-term exposure chemicals such as chlorinated solvents can alter the sensor's performance (YSI Incorporated, 2009). After the re-sampling event, calibration procedures changed (see Field QAQC section of Appendix G for details).

Despite more stringent calibration regimes, field technicians encountered another instrumentation error during the Quarter 2 monitoring event in May 2021. DO concentrations were elevated at all monitoring locations in the reactive zone (1.92 mg/L to 2.70 mg/L). Field technicians continued to collect DO measurements using the YSI Pro-DSS meter during the Quarter 3 and Quarter 4 monitoring events; however, the optical probe materials could potentially be damaged from the presence of solvents in the groundwater or from general wear and tear causing scratches on the paint layer protecting the sensor, and issues during calibrations. DO concentrations in the reactive zone ranged from 0.55mg/L to 0.75 mg/L in Quarter 3, and 0.59mg/L to 0.84mg/L Quarter 4 monitoring. Although DO concentrations were detected above the 0.5 mg/L threshold for anaerobic conditions, other geochemical indicators suggest the reactive zone was in a reductive state. These indicators will be discussed in the subsequent sections.

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4.6.3 Nitrate

Nitrate concentrations decrease under mild reducing conditions in groundwater and typically after DO is depleted to concentrations <0.5 mg/L. Nitrate results are shown in Table 10. During baseline monitoring on 14-16 September 2020, nitrate was below the reporting limit (<1.3 mg/L) at all wells in the reactive zone. Despite elevated DO in later Phase II monitoring events, nitrate concentrations remained non-detect, serving as one line of evidence that the reactive zone was in a reducing state for the remainder of Phase II monitoring.

4.6.4 Ferrous Iron

Ferrous iron species accumulate in the groundwater in strongly reducing environments. Elevated levels of ferrous iron, caused by the reduction of ferric iron, indicate that the groundwater environment is sufficiently reducing to sustain iron reduction. At this state, reductive dechlorination of highly chlorinated VOCs, such as PCE and TCE, may occur if competition from other electron acceptors is low. Concentrations of ferrous iron from Phase II are plotted in Appendix H (Figures H-5-0 through H-5-13) and summarized in Table 10 for the reactive zone wells.

Baseline ferrous iron concentrations, measured in September 2020, were in the range of 0.0 mg/L to 2.0 mg/L in the reactive zone of the treatability study area. Only high-TCE wells S138A, S140A and S146A, and low-TCE well S139A, had detectable ferrous iron concentrations before injections. These wells were in the ROI of the Phase I injections, which indicates the former reactive zone continued to exhibit reducing conditions at the start of Phase II. The downgradient monitoring wells (S025A, S049A and S088A) and the background well (S134A) had no detectable ferrous iron during baseline monitoring.

Ferrous iron concentrations ranged from 0.5 mg/L to 5.0 mg/L in the reactive zone 30 days after injections. The downgradient monitoring wells (S025A, S049A and S088A) had detectable concentrations of ferrous iron, but ferrous iron was not detected in background well (S134A).

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Monitoring wells S138A, S140A, S146A, and S139A which had detectable ferrous iron during baseline monitoring, experienced a sharp increase in ferrous iron after injections, then dropped baseline or below baseline 30 days after injections. As mentioned earlier, these wells were in the Phase I reactive zone and still subject to reducing environment at the time of Phase II injections, Ferrous iron concentrations increased after 30 days at the mid-range wells and low-TCE well S159A.

By 60 days after injections, ferrous iron ranged from 0.0 mg/L to 5.5 mg/L in the reactive zone. Of the wells that had detectable ferrous iron during baseline monitoring (S138A, S139A, S140A and S146A), wells S138A or S139A had no detectable ferrous iron during the Month 2 event, while S140A and S146A returned to baseline levels (0.5 mg/L and 1.0 mg/L, respectively).

Of the monitoring wells in the reactive zone, only S138A and S140A had lower ferrous iron concentrations than baseline levels as of Quarter 4 monitoring in November 2021. All other wells had increased above baseline ferrous iron concentrations.

4.6.5 Sulfate and Sulfide

Sulfate is an alternate electron acceptor for microbial respiration in the absence of oxygen, nitrate, manganese, and ferric iron. Sulfate reduction typically occurs when the groundwater is at a highly reducing state and produces sulfide as a by-product. Depleted sulfate concentrations relative to baseline conditions indicate that the redox environment is sufficient for reductive dechlorination. Sulfate concentrations less than 20 mg/L are desirable but not required for reductive dechlorination of VOCs (EPA, Bioremediation Anaerobic Bioremediation (Direct), 2021). High levels of sulfate and the absence of carbon substrate (low TOC) may indicate that additional substrate is necessary to promote biodegradation. Concentrations of sulfate and sulfide from Phase II are plotted in Appendix H (Figures H-6-0 through H-6-13).

Sulfate levels in the reactive zone were comparable to up/downgradient wells during baseline monitoring with concentrations ranging from 130 mg/L to 240 mg/L at the up/downgradient

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wells, and sulfate in the reactive zone ranging from 110 mg/L to 190 mg/L. However, 30 days after injections, sulfate concentrations in the reactive zone decreased substantially (except for S160A), while the up/downgradient wells remained elevated. Sulfate concentrations at the low-TCE wells decreased to <20 mg/L after 30 days (1.0 mg/L at S137A; <5.0 mg/L at S139A; 6.8 mg/L at S159A). Of the mid-range wells, only S143A reached <20 mg/L after 30 days, while S141A decreased to 89 mg/L and S160A increased to 130mg/L. Sulfate concentrations decreased at the high-TCE wells but only wells S138A and S146A were <20 mg/L at 30 days post-injection.

Sulfate concentrations remained very low at S138A, S158A and S159A during each post-injection monitoring event, including the final monitoring event in 8-10 November 2021, indicating that the strongest reducing conditions may be present at these wells. These wells also had the longest TOC retention times, shown in Figure 6. During the fourth quarter monitoring, sulfate concentrations were above 20 mg/L at all other wells in the reactive zone, and TOC was depleted indicating that additional substate may be required to promote reductive dechlorination (EPA, Bioremediation Anaerobic Bioremediation (Direct), 2021).

Sulfide is a by-product of sulfate reduction and increases as sulfate decreases. Sulfide typically precipitates with iron minerals, but in absence of iron compounds, sulfide may accumulate and become toxic to dechlorinating bacteria. Sulfide concentrations were highest at S138A and S146A; however, sulfide does not appear to have affected DHC populations at these wells as concentrations remained above screening criteria through all of Phase II.

4.7 Dissolved Gases

4.7.1 Carbon Dioxide

Carbon dioxide is generated from the fermentation of the substrate carried out by microbes and utilized as an electron acceptor in the methanogenic process. It is a by-product of both aerobic and anerobic degradation. Elevated carbon dioxide above baseline concentrations indicate microbial activity has been stimulated (EPA, Bioremediation Anaerobic Bioremediation (Direct),

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2021). The concentration of carbon dioxide over the performance period is shown in time series plots in Figures H-7-0 through H-7-11 (Appendix H) and summarized in Table 10, along with other key redox parameters for this evaluation.

Baseline concentrations of carbon dioxide detected in the treatability area ranged from 20.0 mg/L to 78.7 mg/L, with a median value of 27 mg/L. Following the injections, the median carbon dioxide concentration increased to 99.5 mg/L after 30 days (range of 23 mg/L to 284 mg/L in reactive zone). Table 10 shows Phase II carbon dioxide results and statistics.

Microbial activity appeared stimulated by injections during month 1 monitoring event; however, many wells in the reactive zone dropped back to baseline carbon dioxide concentrations after 60 days. This phenomenon was observed at all high-TCE wells and at well S143A, the most western well in the reactive zone. The low-TCE wells and two of the mid-range wells (S141A and S160A) remained stable or increased slightly at 60 days.

Of the high-TCE wells, carbon dioxide concentrations indicate that the most microbial activity occurred at well S158A, where carbon dioxide reached a maximum of approximately 400 mg/L in the fourth quarter. Despite indicators such as VFA concentrations and TOC that implied substrate availability at mid-range TCE wells was poor, carbon dioxide concentrations continued to trend upward through the fourth quarter, with final concentrations of 219 mg/L, 140 mg/L and 271 mg/L at S141A, S143A and S160A, respectively. In the low-TCE wells, carbon dioxide peaked during the 60-day monitoring event at S159A (284 mg/L), and during the final monitoring event at S137A and S139A (155 mg/L and 121 mg/L, respectively).

The fourth quarter sampling results show carbon dioxide concentrations were above baseline conditions. The median carbon dioxide concentration during the fourth quarter was 147.5 mg/L, compared to 27 mg/L during baseline. This was the case for the wells inside the reactive zone, as well as for monitoring locations upgradient and downgradient (wells S134A and S049A).

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Carbon dioxide trends correlate with the levels of alkalinity observed across the study area, refer to Appendix H plots of alkalinity (Figures H-11-0 through H-11-11).

4.7.2 Dissolved Hydrogen

Hydrogen is generated by fermentation of carbon substrate and is rapidly consumed by other bacteria, such as denitrifiers, iron-reducers, sulfate-reducers, methanogens, and dechlorinating microorganisms, such as DHC. These microbes consume available hydrogen at varying efficiencies, with the lower redox state bacteria being the most efficient and higher reducing conditions producing the least efficient hydrogen consumption rates. Therefore, it is possible to estimate the redox state of the groundwater, given the hydrogen concentration. Time series plots showing Phase II hydrogen concentrations are available in Appendix H (Figures H-8-0 through H-8-11).

At hydrogen concentrations less than 0.1 nmol/L (nM), hydrogen is consumed at a very efficient rate, and the redox state of the groundwater is at a denitrification state. Studies show that hydrogen concentrations from 0.2 - 0.8 nM indicate conditions are in the iron (III) reduction redox state; hydrogen of 1 - 4 nM indicate a sulfate reducing redox state; and hydrogen from 5 - 20 nM indicate methanogenesis (Air Force, 2007). Concentrations less than 2 nM may indicate that additional substrate may be required if TOC levels are depleted (EPA, Bioremediation Anaerobic Bioremediation (Direct), 2021).

Additionally, dechlorinating bacteria must successfully compete against other microorganisms that also make use of hydrogen. Existing guidance documents suggest that high sulfate levels may be problematic for reductive dechlorination of VOCs because the presence of elevated concentrations of sulfate can decrease the utilization of substrate for biotic dechlorination of chlorinated solvents (Air Force, 2007). However, the presence of sulfate does not preclude successful EAB applications, refer to Phase II sulfate concentrations in Section 4.6.5.

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During baseline sampling, the median hydrogen concentration in the reactive zone was 1.65 nM (range of 0.61 nM to 53 nM), refer to Table 10 for hydrogen concentrations and statistics. After injections, the median hydrogen concentration increased to 5.6 nM after 30 days. The high-TCE wells in the center of the reactive zone (S138A, S146A and S158A) measured hydrogen concentrations of 210 nM, 120 nM and 64 nM, respectively, after 30 days, which were the greatest of Phase II. Hydrogen concentrations at the background well were below detection 30 days after injections (<0.49 nM at S134A). Background hydrogen increased to above 1mg/L after 60 days, and during the second and third quarter monitoring events.

During the 60 day and first quarter monitoring events, hydrogen concentrations were consistently below 2 nM at S139A and S160A. However, by the second quarter monitoring event in May 2021, hydrogen exceeded 2 nM at every well in the treatability study area, indicating that redox conditions were conducive to reductive dechlorination. Hydrogen concentrations in the high-VOC wells ranged from 3.9 - 14 nM, signifying a methanogenesis redox state at this time (Air Force, 2007). Hydrogen at the low-TCE wells and mid-range TCE wells ranged from 2.2 - 4.4 nM, signifying a sulfate reduction state during the second quarter. In Phase I, it was concluded that sulfate reduction was the dominant redox process in the Phase I treatability area (Locus Technologies, 2018).

After the second quarter, hydrogen concentrations trended downward, and during the fourth quarter monitoring event, only wells S138A and S158A were in the optimal range for reductive dechlorination. Well S159A was just below the optimal range. Additional substrate loading may be necessary to stimulate methanogenesis across much of the treatment zone since the desired threshold of 2 nM was not sustained.

4.7.3 Methane, Ethane and Ethene

The measurement of dissolved gases such as methane, ethane and ethene in groundwater is an indication of bioremediation. Elevated levels of methane indicate fermentation is occurring in a

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highly reducing environment and that subsurface conditions are appropriate for reductive dechlorination. Concentrations of ethene and ethane at levels at least an order of magnitude greater than background levels is evidence of reductive dechlorination of VOCs. However, rapid biodegradation of ethane and ethene often occurs, lowering concentrations of these non-toxic by-products. Time series plots showing Phase II methane, ethane and ethene concentrations are available in Appendix H (Figures H-9-0 through H-9-13).

The presence of methane above background conditions indicates methanogenesis is occurring and methane greater than 1.0 mg/L is desirable for biodegradation (EPA, Bioremediation Anaerobic Bioremediation (Direct), 2021). During baseline monitoring, methane groundwater concentrations were elevated to >1.0 mg/L at wells S137A, S139A, S146A and S160A, refer to Table 10 for dissolved methane concentrations and statistics. The baseline concentration of methane ranged from 0.0035 mg/L to 8.1 mg/L in the reactive zone, and the background concentration at S134A was 0.031 mg/L. After injections, a total of seven wells in the reactive zone reached methane concentrations of at least 1 mg/L after 30 days, but wells S143A, S158A and S159A remained below 1 mg/L. The background methane concentration at S134A decreased from 0.031mg/L to 0.02mg/L after 30 days and remained below 1mg/L throughout the Phase II monitoring period.

In the second, third and fourth quarters, all reactive zone wells were above 1 mg/L except for wells S140A and S146A. Methane levels <1.0 mg/L and the accumulation of cis-DCE and vinyl chloride as seen in Table 9 may indicate that additional substrate or addressing other causes of stalling such as Freon 113 is required to shift reducing conditions into an environment suitable for reduction of these compounds. However, methane concentrations at S140A and S146A were still approximately an order of magnitude higher than background concentrations. Elevated methane concentrations (>1mg/L) were measured during the last three quarters at S049A,

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located immediately downgradient from the reactive zone; however, methane production was not evident at the adverse impact monitoring wells S025A and S088A, located farther downgradient.

Ethane and ethene are the final daughter products in the degradation of chlorinated ethanes and ethenes, respectively. Ethene production is discussed in depth in Section 4.5.2, along with the other TCE daughter products. Concentrations of ethene and ethane at levels at least an order of magnitude greater than background levels is evidence of reductive dechlorination of VOCs. During Phase II, ethene increased from baseline (assumed equivalent to background) levels by over two orders of magnitude at wells S137A, S141A, S143A and S158A; by approximately one order of magnitude at S139A and S159A; and by less than one order of magnitude at S138A, S140A and S146A. Ethene concentrations decreased from baseline at well S160A.

Compared to baseline conditions, ethane increased by over two orders of magnitude at well S137A; by approximately one order of magnitude at S143A, S158A and S159A; and by less than one order of magnitude at S138A, S139A, S140A, S141A and S146A. Ethane also decreased from baseline at S160A. Ethane was less concentrated than ethene across the treatability study area.

4.8 Biological Activity

Biodegradation of VOCs involves specialized microorganisms and hospitable environments. *Dehalococcoides* (DHC) is the only known bacterial group capable of complete reductive dechlorination of PCE to ethene. Studies show that populations of DHC in the groundwater at concentrations greater than $1x10^4$ cells/mL correspond to ethene production at both EAB and natural attenuation sites (Microbial Insights, 2021). This evaluation uses DHC as the indicator bacteria and concentrations $>1x10^4$ cells/mL as the screening criterion to identify areas of the reactive zone where bioremediation is predicted to proceed at generally useful rates. This is a more conservative screening threshold than what was stated in the Work Plan and used in the Phase I evaluation ($>1x10^3$ cells/mL), as recommended by recent studies and Microbial Insights laboratory guidance. Populations of DHC between $1x10^1$ cells/mL and $1x10^4$ cells/mL indicate

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that other site-specific subsurface conditions may be limiting reductive dechlorination and are associated with less ethene production (Microbial Insights, 2021).

Prior to Phase II, efforts were made to quantify native bacterial species in the treatability study area. The initial quantification took place in 2009, in which DHC bacteria population in wells S134A (upgradient), S049A (downgradient) and S145A (unsampled during Phase II) were found to be present but below the DHC screening criterion at 7.2×10^{1} cells/mL, 8.9×10^{2} cells/mL, and 1.2×10^{2} cells/mL, respectively.

In October 2016 prior to Phase I injections, native DHC populations within the study area ranged from 1.0×10^{0} cells/mL to 9.4×10^{2} cells/mL (Locus Technologies, 2018). After Phase I injections, DHC populations increased in the Phase I treatability study area, and wells S137A, S138A and S139A exceeded the screening criterion of 1×10^{4} cells/mL by the third quarter monitoring event in August 2017. Accordingly, ethene production was most pronounced in these wells. Between baseline and the fourth quarter, ethene concentrations increased from <0.2 µg/L to 220 µg/L (100,000%) at S137A, from 0.24 µg/L to 520 µg/L (200,000%) at S138A, and from <0.2 µg/L to 96 µg/L (48,000%) at S139A (refer to Table 9). Wells below the screening criterion produced less ethene. During Phase I, there was a correlation between DHC populations and ethene production.

4.8.1 Direct Measurement

During Phase II of the treatability study, samples were collected for microbial evaluation during the baseline, 90-day, Quarter 3 and Quarter 4 monitoring events at twelve groundwater wells (no microbial samples from downgradient wells S025A and S088A). Between Phase I and Phase II, DHC populations fell to below the screening criteria at all wells in the study area as indicated by Phase II baseline concentrations seen in the Appendix H plots (Figures H-10-0 through H-10-11). However, ethene concentrations remained elevated at most wells in the reactive zone.

After Phase II injections, DHC populations surpassed 1×10^{4} cells/mL in the reactive zone (confirmed during the 90-day monitoring event), except for well S160A which barely met the

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target DHC. Upgradient and downgradient wells experienced negligible increases in DHC after 90 days. Despite S049A's proximity to the injections, DHC remained below $1x10^4$ cells/mL through all post-injection monitoring events.

The highest DHC populations in Phase II were typically found in the high-TCE wells in the southern end of the study area. After injections, DHC concentrations were at least one order of magnitude above the DHC screening criterion of $1x10^4$ cells/mL at wells S138A, S158A and S140A throughout Phase II. Accordingly, these wells produced the most ethene. The maximum DHC concentration was detected during the final monitoring event at S138A at over two orders of magnitude above the DHC screening criterion ($1.2x10^6$ cells/mL).

The mid-range and low-TCE wells, as well as S146A (high-TCE), exhibited concentrations around the DHC screening criterion of $1x10^4$ cells/mL during most of Phase II. However, during the third quarter monitoring event, wells S159A and S160A fell below $1x10^4$ cells/mL DHC and final DHC populations were $2x10^3$ cells/mL and $4.7x10^3$ cells/mL, respectively. This drop did not seem to affect the performance at S159A based on the VOC concentrations, however the lack of DHC and TOC at S160A indicates that not enough injection solution was present in the well.

During Phase II, functional genes produced by dechlorinating bacteria were also analyzed. VOC reductase genes provide a supporting line of evidence when evaluating the potential for accumulation of daughter products versus the potential for complete reductive dechlorination to ethene (Microbial Insights, 2021). The DHC strain functional genes evaluated include tceA reductase (abbreviated TCE, not to be confused with trichloroethene), Vinyl Chloride Reductase (VCR), and BAV1 Vinyl Chloride Reductase (BVC). These DHC functional genes encode reductive dehalogenases that dechlorinate TCE, cis-DCE and vinyl chloride. Refer to the microbial population plots in Appendix H (Figures H-10-0 through H-10-11).

The functional gene TCE indicates the potential for dechlorination of TCE, but the absence of TCE gene does not preclude the potential for reductive dechlorination. Populations of the TCE gene

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followed a similar geospatial trend to DHC, with the highest TCE genes typically found at the high-TCE wells, especially during the final two monitoring events. The up-gradient and down-gradient wells, S134 and S049A, generated substantially fewer TCE genes than the wells in the reactive zone.

The functional gene VCR encodes a DHC reductase enzyme responsible for dechlorination of cis-DCE and vinyl chloride to ethene. The BVC gene encodes an enzyme that dechlorinates vinyl chloride to ethene. The absence of both VCR and BVC genes suggest vinyl chloride may accumulate (Microbial Insights, 2021). During Phase II, BVC was below detection in the treatability study area. The amount of VCR in reactive zone wells increased after injections. Like other microbial indicators have shown (DHC and TCE gene), VCR was lower in the up/down gradient wells, and this was true throughout Phase II. The lowest VCR populations in the reactive zone were found in well S146A, which was on the higher end of the spectrum for DHC and TCE genes. As seen in Table 9, Vinyl chloride rebounded at well S146A in the fourth quarter, cis-DCE remained elevated during Phase II .and TCE rebounded in the third quarter at this well. Because vinyl chloride has accumulated in other wells, the functional genes VCR and BVC do not appear to accurately reflect the site dechlorination conditions and are not recommended to be used in the future as indicator parameters.

4.8.2 pH and Alkalinity

While microbial populations can tolerate a wide pH range, a neutral pH of between 6 and 8 is most conducive to the microbial growth (Parsons, 2004). Fermentation of substrates to metabolic acids and hydrochloric acids during dechlorination may decrease the pH substantially in low-alkalinity groundwater environments; therefore, monitoring of pH and alkalinity is crucial in the treatability zone. Concentrations of alkalinity that remain at or below background in conjunction with pH above 5 indicates that additional buffering agent could be required to sustain high rates of anaerobic dechlorination (EPA, Bioremediation Anaerobic Bioremediation (Direct), 2021).

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Temporal plots showing trends in pH and total alkalinity are available in Appendix H (Figures H-11-0 through H-11-11).

Baseline total alkalinity at groundwater wells inside the reactive zone ranged between 350 mg/L and 690 mg/L (see Table 6). Fourth quarter alkalinity increased above baseline reactive zone wells except for S146A. Alkalinity increased most at wells S137A, S141A, S158A, and S159A. Alkalinity correlated with trends in carbon dioxide, see Appendix H plots and carbon dioxide discussion in Section 4.7.1.

Baseline pH values ranged from 6.60 – 7.12 in the reactive zone with the median pH of 6.95. During injections, the pH mostly decreased but then returned to nearly baseline levels through the remainder of Phase II. In the fourth quarter, the median pH in the reactive zone was 6.72, and pH values ranged from 6.44 – 7.20.

The buffering capacity of the reactive zone sustained pH levels within recommended values throughout the study. A slight increase in alkalinity was observed across the treatability area with the exception of high-TCE well S146A, which still maintained a pH above 6, thus microbial populations in the reactive zone had a conducive growth environment in terms of pH and alkalinity.

4.9 Freon 113 Concentrations

Quantification of the effectiveness of injections at promoting anaerobic degradation of Freon 113 in wells S140A and S141A is one of the Phase II objectives stated in Section 2. This section reviews trends in Freon 113 concentrations in these key wells, as well as monitoring locations across the expanded Phase II treatability study area. Refer to Appendix H plots (Figures H-2-14 through H-2-27 Freon 113 molar concentrations; Figures H-3-14 through H-3-27 show units of micrograms per liter) and the summary of key analytical results in Table 9.

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During baseline monitoring, the background concentration of Freon 113 was non-detect (<2.0 µg/L at S134A) and was only detected at one downgradient well (S025A at a concentration of 5.1 µg/L). Freon 113 in the reactive zone was most concentrated in the high-TCE wells with concentrations of 1,500 µg/L at S158A, 2,000 µg/L at S138A and 4,300 µg/L at S146A. The next highest Freon 113 concentration was observed at S141A (240 µg/L). The rest of the mid-range and low-TCE wells had Freon 113 concentrations less than 25 µg/L during baseline monitoring.

Freon 113 in all high-TCE wells remained elevated approximately 30 days after injections, while concentrations in the rest of the reactive zone decreased. At high-TCE wells S138A and S158A, Freon 113 increased by 80% and 93% after approximately 30 days following injections, respectively. Wells S138A and S158A increased once more during Month 2 monitoring approximately 60 days after injections (53% and 62%, respectively).

Approximately 90 days after injections, Freon 113 in the high-TCE wells decreased from Month 2 concentrations by 55%, 43%, 21% and 37% at the high-TCE wells S138A, S140A, S146A and S158A, respectively. For the next three quarterly monitoring events, Freon 113 concentrations continued to decline at wells S138A. Freon 113 concentrations rebounded at S158A during the fourth quarter (79 µg/L to 860 µg/L) but remained below baseline concentrations.

Approximately 360 days after injections, Freon 113 decreased to 630 µg/L at S140A but increased to 6,100 µg/L at S146A. Freon 113 degradation was least apparent at these high-TCE wells, with final Phase II Freon 113 concentrations above or near baseline conditions. Freon 113 inhibits reductive dechlorination by DHC (specifically *Dehalococcoides mccartyi*) in a concentration-dependent manner, causing cis-DCE stalls (Im J, 2019). During Phase I, high concentrations of Freon 113 at well S140A were attributed to stalling in cis-DCE degradation, as discussed in the Phase I evaluation report (Locus Technologies, 2018). Again during Phase II, cis-DCE stalled at S140A as well as S146A (refer to Section 4.5.2.3). High Freon 113 concentrations were likely a contributing factor in the stalling. Compared to Phase I baseline concentrations, cis-

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DCE increased by 96.3% and 1,248% at S140A and S146A, respectively, across the Phase I and Phase II monitoring periods.

Concentrations of Freon 113 remained non-detect or very low (<5.2 µg/L) in the downgradient and background wells throughout Phase II. Freon 113 at the low-TCE and mid-range TCE wells trended downward throughout the Phase II monitoring period, except for mid-range well S141A, which experienced rebounding of Freon 113 during the second quarter increasing from 22 µg/L to 120 µg/L. Freon 113 concentrations decreased during the fourth quarter at S141A to 51 µg/L.

From baseline to the fourth quarter, Freon 113 concentrations at wells S138A, S139A, S141A, S143A, S158A and S159A were reduced by 80%, >50%, 79%, >94%, 43% and >98%, respectively. Freon 113 concentrations at wells S137A, S140A and S160A were below the action level throughout Phase II monitoring. Only well S146A increased from baseline concentrations by approximately 42%.

4.10 Volatile Fatty Acids (VFAs)

Volatile fatty acids (VFAs) are produced during fermentation of the substrate. Elevated concentrations of VFAs indicate microbial activity and substrate distribution. Key VFAs monitored during Phase II include lactic acid, acetic acid, pentanoic acid, propionic acid, pyruvic acid, and butyric acid. Concentrations of VFAs greater than 10 mg/L to 20 mg/L indicate that sufficient levels of substrate is available for redox processes to proceed (EPA, Bioremediation Anaerobic Bioremediation (Direct), 2021). Insufficient VFA concentrations imply additional substrate is required. Plots of VFAs are available in Appendix H (Figures H-12-0 through H-12-11), shown with the lower VFA threshold of 10 mg/L.

Acetic acid was the most prevalent VFA produced in the reactive zone. During baseline monitoring, acetic acid was present but in low concentrations in all wells in the reactive zone (0.31 mg/L to 3.6 mg/L), as well as at the upgradient and downgradient wells (range of 0.3 mg/L to 0.41 mg/L). One month after injections, acetic acid concentrations increased to >20 mg/L at

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all wells in the reactive zone except wells S141A and S160A (well S141A was within the lower end of VFA threshold at 12 mg/L). Through the fourth quarter, acetic acid concentrations remained greater than 20 mg/L at wells S138A and S158A, and above 10 mg/L at S159A. There is correlation between acetic acid concentrations and TOC retention times, in which the lowest TOC retention times and acetic acid concentrations are found at S141A and S160A, while the highest TOC retentions and acetic acid concentrations are at wells S138A, S158A and S159A.

Lactic acid was the only VFA at S160A to breach 10 mg/L, which occurred during the fourth quarter (<0.53 mg/L to 17 mg/L). Similarly, during the fourth quarter, lactic acid concentrations increased from below detection (<0.53mg/L) to above the VFA threshold of 10 mg/L at wells S139A, S140A, S141A, S143A, and S158A.

Other VFAs monitored in Phase II only surpassed the VFA concentration threshold at a few high-performing wells in the reactive zone. Butyric acid exceeded 10 mg/L only at wells S158A and S159A. Concentrations of pentanoic acid, propionic acid and pyruvic acid exceeded 10 mg/L only at well S159A, which is the only monitoring location to achieve complete reductive dechlorination of VOCs to below action levels (refer to VOC concentrations at low-TCE wells Section 4.5.2.1). Thus, acetic acid seems to be the most useful VFA indicator for this injection solution and site, and the collection and evaluation of other VFAs is not recommended for future evaluations.

4.11 Adverse Condition Monitoring

Wells in the area of the EAB treatability study area were monitored for adverse conditions that may inadvertently be caused by the introduction of EAB products in the subsurface. Monitoring and sampling were conducted using Table 4 of the Work Plan. This evaluation was limited to two metals which can be released under reducing conditions, manganese and arsenic. This discussion also addresses potential EAB induced VOC increases outside the Phase II reactive zone.

Concentrations of manganese and arsenic were compared upgradient of the study area, within the study area, and within two wells downgradient of the study area, S025A and S088A. As

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previously discussed, arsenic and manganese laboratory methods changed to dissolved analysis second quarter 2021 after it was discovered that total metals were erroneously collected and analyzed from baseline through first quarter. However, because total metal concentrations represent the dissolved (soluble) and particulate (insoluble) states, it is more conservative and will still be used in conjunction with dissolved metals for this analysis.

4.11.1 Manganese

Manganese monitoring data are presented in Table 4 and plotted in Appendix H (Figures H-13-0 through H-13-13). Manganese concentrations in upgradient well S134A, which represents background conditions for this study, were relatively stable or slightly decreasing concentration with an average around 450 µg/L. Within the treatment area, manganese concentrations increased after injections, then decreased or remained stable during the performance monitoring period. For example, well S138A located in the middle of the Phase II treatment area (also within the Phase I treatment area) (Figure 2), increased from a baseline concentration of 340 µg/L to 1800 µg/L 90 days after injections and remained elevated above baseline through the performance monitoring period. Well S158A, a well located on the north end of the Phase II treatment area, and newly installed for this phase, exhibited an increase in manganese concentrations through the third quarter (14,000 µg/L) then decreased fourth quarter. Thus, as expected, manganese concentrations increased in response to the injection solution in the Phase II treatability study area.

Well S049A, located approximately 40 feet downgradient of the Phase II treatability area, had a slight increase in manganese approximately 180 days after injections, then decreased to below baseline levels. Well S088A, located approximately 120 ft downgradient of the Phase II treatability area, did not demonstrate an increase in manganese concentrations. Well S025A, which is 364 feet downgradient of the Phase II treatability area, also did not demonstrate an increase in manganese concentrations. Both wells slightly decreased in concentrations over the Phase II

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monitoring, similar to the background well. Because wells furthest downgradient of the treatment area did not exhibit an increase in manganese concentrations, this indicates the impacts of the injection solution largely remain around the treatment area and are not creating an adverse condition with respect to manganese outside the area.

4.11.2 Arsenic

Arsenic monitoring data are presented in Table 6 and plotted in Appendix H (Figures H-13-0 through H-13-13). Because of non-detect results with elevated laboratory reporting limits, comparisons against baseline arsenic concentrations could not be made with certainty. Non-detect results were also reported periodically in various wells throughout the performance monitoring period. Thus, evaluations for arsenic impacts are limited to comparisons against background.

Arsenic concentrations in the upgradient background well S134A were non-detect or estimated around 8-10, approximately 90-270 days after injections. The highest arsenic concentrations within the treatability area were noted in wells S139A, with a maximum arsenic concentration of 63 µg/L. Wells S137A, S140A, S143A, S146A, S158A, S159A, and S160A also exhibited arsenic concentrations above background from an estimated 15 µg/L - 21 µg/L. Well S049A, just downgradient of the treatability study area was non-detect for most events with two estimated concentrations of no more than 12 µg/L. Downgradient wells S025A and S088A post-injection concentrations were non-detect with reporting limits between 4.4-19 µg/L.

Because of the elevated reporting limit at the baseline event, it is not clear whether arsenic concentrations increased in response to injections in the Phase II treatability study area. Arsenic in some wells did increase, however concentrations are do not show an upward trend at the end of monitoring as seen in the Appendix H plots. This indicates arsenic will not be continually generated at the treatment zone. Increases were not observed at the two wells furthest

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downgradient of the treatability study area, thus, adverse arsenic conditions are not being created by the EAB injections.

4.11.3 VOCs

Degradation by-products (daughter products) are generated as a result of EAB as discussed in Section 4.5. Cis-DCE and vinyl chloride in particular were generated within the reactive zone, sometimes resulting in concentrations higher than their baseline and action levels. This discussion focuses on potential impact of EAB daughter products downgradient of the Phase II reactive zone. Appendix H Figures H-2-0 through H-2-13 show VOCs in terms of moles per liter and Figures H-3-0 through H-3-13 show VOCs in terms of micrograms per liter.

Wells S049A, S088A, and S025A monitor groundwater downgradient of the Phase II reactive zone. As seen in the Appendix H VOC plots, at well S049A, which is located approximately 40 feet downgradient of the reactive zone, cis-DCE and vinyl chloride peaked during the second quarter monitoring event at approximately 180 days after injections. By the fourth quarter, vinyl chloride and cis-DCE decreased to below Phase II baseline concentrations but remained above action levels. The peak in daughter products at well S049A demonstrates that reductive dechlorination was likely stimulated as a result of injections.

The other two downgradient monitoring locations are located farther away from the reactive zone and were not directly impacted by Phase II injections. At well S088A, which is approximately 120 feet downgradient, daughter products remained relatively stable until the fourth quarter monitoring event when cis-DCE, vinyl chloride and ethene increased. This may indicate that EAB daughter products migrated to a distance of 120 feet after 360 days following injections. At S025A, which is 364 feet downgradient of the reactive zone, the detection of migrating daughter products is unclear. Vinyl chloride increased 30 days after injections, then decreased to below baseline concentration approximately 180 days after injections, and vinyl chloride increased in

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the fourth quarter. Cis-DCE increased 180 days after injections and decreased in the fourth quarter.

In summary, an increase in daughter product concentrations at S088A during the fourth quarter monitoring event may indicate that EAB daughter products migrated to a distance of 120 feet 360 days after injections.

4.12 Soil Vapor Methane Monitoring

The results of the soil vapor well sampling events are presented in Table 7. Copies the analytical reports from the soil vapor sampling events are included in Appendix F.

4.12.1 Evaluation Criteria

Methane results from the soil vapor wells were screened against the same criteria as was groundwater well-head methane vapor: 10% of methane's LEL, which is 5,000 ppm. If methane was detected in concentrations lower than 5,000 ppm at the soil vapor wells, it suggested that the elevated methane concentrations detected in groundwater and well-head vapor were laterally constrained to the Phase II Treatability study area and that methane was attenuating before reaching nearby receptors. However, if methane is detected in concentrations greater than 5,000 ppm at the soil vapor wells, it provided a line of evidence that elevated methane concentrations in soil vapor extended laterally beyond the Phase II Treatability Study Area. This scenario would present potential health and safety issues for the occupants of both 815 Stewart Drive and 440 Wolfe Road as well as the field staff present on-site during groundwater and soil vapor monitoring activities. As such, the table below outlines the actions established for methane screening criteria.

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Soil Vapor Well Methane Concentration Criteria	Action
<10% LEL (5,000 ppm) in soil vapor wells	• Continue monitoring soil gas wells near receptors at the frequency specified by the well head and groundwater methane concentration results • Monitor soil vapor wells for oxygen
>10% LEL (5,000 ppm) in soil gas wells	• Notify EPA • Venting and/or mitigation • Monitor soil vapor wells for oxygen

4.12.2 Helium Results

To evaluate if soil vapor samples have become diluted by ambient air during the sample collection process, Locus collected samples under a helium gas shroud. In general, a detection of helium suggests that some degree of leaking occurred during sample collection. Per the 2015 DTSC and RWQCB guidance, an ambient air leak of 5% is acceptable for the purposes of data evaluation in active soil gas investigations. The leakage ratio is obtained using the following expression:

$$\text{Estimated Leak Ratio (\%)} = \frac{\text{[Concentration of Helium in Sample (\%)]}}{\text{[Mean Concentration of Helium in Shroud (\%)]}} \text{ X } 100$$

Helium was detected in three regular field samples and one field blank sample. The leakage ratio was under 5% for the field samples, indicating they are within quality control limits and the data can still be used reliably for decision-making purposes. The detection of helium in the field blank most likely suggests a leak in the connection between the summa canister collecting the blank sample and the 1-liter Tedlar bag of nitrogen blank gas. Since this issue is constrained to a particular fastener in the blank sample train, this helium detection does not impact the data quality from this 8 June 2021 sampling event.

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4.12.3 Methane Results

Methane was not detected at any of the vapor well locations, except on one occasion at a concentration of 8900 ppm in SGI003A, on 17 July 2021. This anomalous result at SGI003A, however, is likely explained by the high methane recovery that the laboratory observed for the entire analytical batch. Furthermore, methane was not detected by the field instrument immediately following sample collection at SGI003A during this event, nor was it detected in the adjacent deeper implant, SGI003B, at the lab or in the field. Locus resampled both SGI003A and SGI003B on 6 August 2021 for confirmation and methane was not detected in either well.

4.12.4 Soil Vapor Monitoring Conclusions

Seven complete monthly soil vapor sampling events were conducted from February to July 2021 and one confirmation sampling event in August 2021. Over this period, methane was not detected in the soil vapor wells, except for one instance at SGI003A in which there was a laboratory discrepancy. Moreover, the confirmation resampling event at SGI003A and SGI003B, just over three weeks later, confirmed that methane was below detection. On this basis, the data strongly suggests that any biogenic methane generated as a result of anerobic bacteria activity during the Phase II Study was laterally constrained to the treatability study area and had attenuated before reaching nearby receptors. Thus, a hazard to workers, buildings, or its receptors was not present during the EAB Phase II performance cycle.

5 Additional Limited Groundwater Velocity Investigation

Over the course of the post-injection groundwater monitoring program, it was observed that concentrations of TOC, which is an indicator of SRS-SD substrate distribution, varied significantly from location to location. As discussed in Section 4.4.14.4 and seen in Figure 6, there were certain locations, such as S141A and S160A, wherein TOC was detected below the ideal concentration of 20 mg/L or greater, after a period of just one month or less following the injections. On the other hand, there were wells such as S138A, S158A, and S159A, in which TOC concentrations remained

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above 20 mg/L for the entirety of the post-injection monitoring period. The substrate distribution ultimately affected the performance of the EAB as discussed in Section 4.5.

Given this high variability in TOC distribution amongst wells that are clustered relatively close to one another, it is hypothesized that the local hydrogeologic conditions and small-scale variability within the Phase II study area may have influenced TOC retention. That is, a zone or multiple zones of preferential groundwater flow within the Phase II study area A-aquifer would provide a potential explanation as to why SRS-SD substrate was depleted at some locations, and not at others. Thus, a limited groundwater velocity investigation was developed and proposed to the EPA on 18 October 2021 via email, as a supplemental effort to the approved Work Plan for the Phase II study. The scope included monitoring of several Phase II study area wells at different depths. Lithologies from boring logs were reviewed as the basis for monitoring depth and permeable layers identified.

After initial rescheduling due to equipment availability, the investigation was conducted from 10 to 14 January 2022. In addition, not all wells were investigated as originally planned because of equipment limitations. Further details are discussed in the below sections.

5.1 Hydraulic Influences on Phase II Study Area

There are two known external factors that would likely influence any potential preferential groundwater flow in the local subsurface of the Phase II study area. First, there is an actively operating basement dewatering sump at the 440 Wolfe Road property, to the northwest. Figure 2 shows the sump, 440S, in relation to the Phase II study as well as 2020 groundwater contours. This sump continuously operates with a flow rate of approximately 50 gpm and has a significant influence on groundwater elevations in the area, as shown by the contours in Figure 2. The direction of groundwater is northwest towards the sump in much of the study area.

In addition to the 440 Wolfe sump, two trenches exist within the Phase II study area that partially coincide with the injection depths, which range from 15 to 36 ft-bgs. One trench is a former

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utility trench that runs northwest-southeast on the eastern side of the Phase II study area as seen in Figure 5, installed at an estimated depth of 7 to 9 ft-bgs. Per the original drawings, this trench was backfilled with aggregate base Class II backfill, which is predominantly gravel grains up to 0.75 inches in diameter (Emcon, 1984). The other trench is the former 811 Arques extraction trench, which runs east-west through the northern portion of the Phase II study area. This former extraction trench was installed to a maximum depth of 24 ft-bgs and extends 80 feet in length. This trench was backfilled with 10 inches of 0.75-inch diameter pea gravel (Emcon, 1984).

5.2 Investigation Methods

These high permeability lithologies within the Phase II study area combined with the hydraulic influence of the 440 sump present conditions that could contribute to possible preferential groundwater flow away from the Phase II study area. Between 10 to 14 January 2022, a limited investigation was implemented utilizing a Geotech Colloidal Borescope instrument to characterize groundwater flow velocity and direction at wells within and adjacent to the Phase II study area. The Colloidal Borescope is a down-well instrument that uses magnified imagery and a compass sensor to track moving particles suspended in the water column and determine horizontal velocity and trajectory of flow in real-time (Geotech, 2021). The Colloidal Borescope's specifications state it can observe flow at a pore scale and measures velocities ranging from 0 to 30 mm/sec (30,000 µm/sec or ~8500 feet/day), although Geotech indicated that velocities greater than ~200 µm/sec are ideal for obtaining useful data within a reasonable time frame. Real-time measurements are seen and recorded in Geotech's AquaLITE program.

At each well, different depths within the screen interval were monitored to test for consistent flow patterns. Generally, a consistent flow pattern is identified when particles are flowing with a stable average velocity and direction over the course of 10 to 15 minutes. This period gives the suspended particles in the well time to settle after lowering the instrument down and flow patterns, if present, to emerge. A low permeable skin surrounding the well screen will result in

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groundwater flowing around the well and swirling flow within the well. Swirling can be identified by the flow of particles abruptly changing in velocity and direction for an extended period. In this way, the real-time readings inform the depths at which reliable data could be collected in each well. Although the well construction logs were used to identify high permeability lithologies within each screen interval, multiple depths were monitored at well to identify potential high permeability lenses within the beds of predominantly clay and silt.

To ensure proper particle tracking, instrument parameters required adjustment from location to location, and sometimes from depth to depth. These parameter adjustments were generally contingent on the turbidity of groundwater. Specifically, the following parameters required adjustment: particle size, particle sensitivity, capture rate, maximum particle speed, and minimum number of particle matches for vector determination. Once the tracking screen in AquaLITE visually mirrored that of the actual camera feed, it could be determined that particles were being accurately tracked.

If a consistent flow pattern was observed at a well at a particular monitoring depth for 10 to 15 minutes, a new AquaLITE file was created, and data was collected at that depth for roughly one hour. The table below details the dates on which each well was monitored.

Date	Velocity Monitoring Locations
1/10/2022	S142A, S143A, S159A, S160A
1/11/2022	S134B1, S140A, S160A
1/12/2022	S138A, S139A, S141A, S142A, S158A
1/13/2022	S049A, S137A, S146A, S158A, S159A
1/14/2022	S138A, S141A

5.3 Groundwater Velocity Investigation Results

Groundwater velocity at most locations and at most depths could not be measured as originally planned within the timeframe of the investigation. As mentioned earlier, the ideal borescope velocity for stabilization within an hour time frame is approximately 200 µm/sec. However, the

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most recent estimate of groundwater seepage velocity within the Phase II study area, used for the design of substrate volumes, was 0.03 ft/day (0.106 µm/sec). (Locus Technologies, 2020). For the borescope to accurately measure particle velocities of 0.03 ft/day, a monitoring period of hours and possibly even days would be required. Thus, the borescope was used to identify and record consistent flow patterns at discrete depths in each well that deviated from the expected low flow conditions. The depths at which consistently higher groundwater velocities were detected were then examined as potential preferential groundwater flow zones.

Monitoring data was collected after consistent flow patterns were observed at the three following wells: S138A, S141A, and S158A. At S138A, data was collected at 14 ft-bgs and 20 ft-bgs. At S141A, 16.8 ft-bgs and 22 ft-bgs At S158A, data was collected at 16 ft-bgs. Copies of the monitoring summaries from each location and depth are presented in Appendix I.

5.3.1 Data Usage and Interpretation

The Colloidal Borescope utilizes vector-based analysis to determine the true direction and velocity of particle flow. The vector-based values are slightly different than an overall average of all each measured quantity. This is because taking the average of vector data requires consideration of both the direction and the magnitude of velocity. For instance, if a particle is moving due north at 200 µm/s and a second particle is moving due south at 100 µm/s, a simple average of the velocities and directions would yield a velocity of 150 µm/s in the due east direction. However, a vector-valued average result also includes the influence of the magnitude of velocity and, in this case, would yield a flow rate of 100 µm/s in a due north direction. In nearly all cases, the vector-based determination of net flow is the most accurate way to determine velocity and direction over a monitoring (Geotech, 2021). As such, groundwater flow will be reported and discussed based on averages derived from vector analysis.

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5.3.2 S138A Results

The average measured groundwater velocity in S138A at 14 ft-bgs was 179.59 µm/s, or 50.91 ft/day, with an average flow direction of 61.66° (northeast). The values for this depth were calculated based on 3650 observations collected over a 64-minute monitoring period on 14 January 2022. At 20 ft-bgs, the average velocity was 198.35 µm/s, or 56.23 ft/day, in the average direction of 70.73° (east northeast). Over a 62-minute monitoring period on 14 January 2022, 3579 observations were collected for this 20 ft-bgs monitoring depth. The soil at 14 ft-bgs was logged as clayey sand (SC), comprised of 50% fine to coarse sand and 10% gravel. At 20 ft-bgs, the soil type was sandy clay (CL), with 35% fine to coarse sand, 5% gravel, and extensive rootlet networks.

At both depths, the velocity of suspended particles remained stable for the entire monitoring period. This suggests that the initial disturbance caused by placing the borescope at the monitoring depths had subsided and the flow of particles was not due to external disturbances. There was, however, some variability in flow direction during the monitoring periods for both depths. In both cases, flow direction oscillated from roughly 30° to 90° on 10-minute intervals, see Appendix I. Given this oscillation, there is a lower degree of certainty that the velocity and flow direction is reliable.

5.3.3 S141A Results

The average measured groundwater velocity in S141A at 16.8 ft-bgs was 159.18 µm/s, or 45.12 ft/day, with an average flow direction of 340.69° (north northwest). The values for this depth were calculated based on 392 observations collected over a 56-minute monitoring period on 12 January 2022. At 22 ft-bgs, the average flowrate was 238.91 µm/s, or 67.72 ft/day, in the average direction of 340.29° (north northwest). Over a 11-minute monitoring period on 14 January 2022, 299 observations were collected for this 22 ft-bgs monitoring depth. This monitoring period was limited by time constraints on the final monitoring day. The soil at 16.8

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ft-bgs was logged as sand to silty sand (SP-SM), comprised of 80% fine to coarse sand and 10% gravel. At the 22 ft-bgs depth, the borescope was set at the approximate contact between a clay (CL) lithology with just 5% fine to coarse sand and a sandy clay (CL) bed containing 40% fine to coarse sand and trace gravel.

As compared to the monitoring conditions at both S138A and S158A, groundwater in S141A was significantly less turbid. This is reflected in the lower particle counts and is supported by turbidity measurements taken at S141A during the Quarter 4 sampling event, in which turbidity never exceeded 0.9 NTU. At both monitoring depths, the flow direction of suspended particles remained stable in the northwest direction for the entire monitoring period. This suggests that the measured flow of particles was not due to external disturbances. At the 16.8 ft-bgs monitoring depth, velocity measurements were relatively stable around the mean. At the 22 ft-bgs monitoring depth there was, however, a 1-minute spike in flow velocity that corresponds with a change in flow direction from northwest to southeast. This anomaly likely biases high the flow velocity. Immediately after the disturbance, the velocity and flow direction stabilized to the flow pattern of northwest flow velocity of roughly 200 µm/s that was observed prior to initiating the monitoring period at 22 ft-bgs. A longer monitoring period at this depth would have likely sustained this trend.

5.3.4 S158A Results

The average measured groundwater velocity in S158A at 16 ft-bgs was 37.90 µm/s, or 10.74 ft/day, with an average flow direction of 147.01° (south southeast). These results are based on 3698 observations collected over a 77-minute period on 13 January 2022. The soil at 16 ft-bgs was logged as sand to poorly graded sand with silt (SP-SM). Approximately 10 minutes after beginning the monitoring period, the measured velocity and direction of flow started exhibit random behavior. These random shifts in direction and magnitude of velocity lasted for the duration of the monitoring period, indicating the borescope was likely measuring swirling flow

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within the well caused by impermeable lithologies at the probe depth. Thus, this data cannot be treated as reliable.

5.3.5 Discussion of Velocity Results

The average flow direction and velocity of groundwater in S138A at both monitoring depths was very consistent: 50.91 ft/day towards 61.66° (northeast) at 14 ft-bgs and 56.23 ft/day towards 70.73° (east northeast) at 20 ft-bgs. This strong observed trend towards the northeast at both depths exaggerates the slight eastward deviation from due north in regional groundwater flow represented in Figure 2 of the 2020 Groundwater Monitoring Report (Locus Technologies, 2021). Per the report, the A-aquifer regional groundwater flow bearing trends at around 15° degrees (north northeast) near the Phase II study area (excluding the impact of the 440 sump). While the direction of flow at S138A is not completely consistent with regional groundwater flow, it is possible that within certain high permeability lithologies in the Phase II study area, groundwater flow trends slightly more eastward than previously estimated. More highly resolved groundwater elevation data within the Phase II study area would potentially augment this finding. For purposes of this study, the groundwater flow results are determined to be uncertain and thus neither the groundwater flow nor velocity should be used to form conclusions.

158A flow monitoring exhibited random shifts in direction and magnitude of velocity that lasted for the duration of the monitoring period, indicating the borescope was likely measuring swirling flow within the well caused by impermeable lithologies at the probe depth. Thus, this data cannot be treated as reliable, and it should not be used to form conclusions.

In S141A, the average flow direction at both monitoring depths was remarkably similar, although flow velocities were slightly different: 45.12 ft/day towards 340.69° (north northwest) at 16.8 ft-bgs and 67.72 ft/day towards 340.29° (north northwest) at 22 ft-bgs. Both monitoring depths are generally consistent with the 2020 Groundwater Monitoring Report groundwater flow direction and are within the injection depth range of 15 to 36 ft-bgs. Similarly, both 16.8 and 22

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ft-bgs could be depths consistent with the nearby former 811 extraction trench depth. The true depth of the trench's pea gravel backfill remains uncertain as the ground surface has changed since the trench was originally installed, but the depth to bottom measured in the field at the former sump access point was 20.40 ft-bgs. This depth could potentially coincide with one or both monitoring depths at S141A, providing a high permeability zone for groundwater to preferentially flow away from Phase II study area.

Based on the wells measured in this investigation, S141A was the sole well with reliable data, with a velocity that ranged from 45.12 to 67.72 ft/day and a direction of around 340° (north northwest). These velocities constitute a marked difference from the estimated Phase II study area seepage velocity of 0.03 ft/day calculated in the Work Plan (Locus, 2020). At each monitoring depth, the lithology corresponded well with the measured flow. That is, the proportion of coarse-grained sediments in the soil type would be sufficient for allowing enhanced groundwater flow at each monitoring depth. As such, the presence of these detected zones of higher groundwater flow provides a line of evidence to suggest that there is heterogeneous velocity and direction of groundwater flow within the Phase II study area.

As another measure of groundwater velocity in the vicinity of the Phase II study area, the presence of substrate material was observed in sediment filters handling water from the 440 Wolfe basement sump. The material was detected within eight days after the first injection activities on 10 November 2020, when it reached sufficient concentration to clog the filters. Based on this observation, the substrate likely initially reached the sump within less than eight days. Based on the distance and direction from the injection area to this sump (approximately 290 feet, 315° northwest), the calculated average groundwater velocity to reach the sump in eight days is 36 ft/day. If the substrate arrived within six days of injection, the calculated velocity would be 48 ft/day. This calculated value is reasonably consistent with range directly measured in S141A (45-

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68 ft/day), suggesting that these velocities are representative, at least for the area northwest of the Phase II study area.

In summary, the presence of multiple elevated groundwater velocity flow zones in the direction of the 440 Wolfe Sump at S141A likely account for the rapid loss of TOC observed during the post-injection monitoring period. It also provides insights as why the same poor TOC retention may have occurred at other wells within the Phase II study area. Additionally, the unexpected direction of flow at multiple depths in S138A, underscores the need for better understanding of the hydrogeologic conditions underlying the Phase II study area.

6 Summary of Results

Phase II of the Signetics EAB treatability study was conducted from September 2020 to November 2021. Radius of influence, delivery techniques, TOC retention time, COCs, and multiple other performance indicator parameters were monitored as part of the effort as discussed in detail in Section 4. This section summarizes the EAB performance by reviewing monitoring results in each well for a selected number of parameters as seen in Table 11. Wells are discussed by baseline TCE concentrations groups: low, mid-range, and high-TCE wells (refer to Section 4.2.1).

6.1 Low-TCE Wells

S159A well monitoring results indicated successful EAB performance overall. All key VOCs were reduced to below action levels. This is attributed to a TOC retention time of four quarters which enabled reducing conditions and dissolved gas production. While DHC populations dropped just below the performance criteria in the third quarter, the population was sufficient enough to continue reductive dechlorination. This well was located 10 ft cross gradient of INJ-4. The injection was delivered via the TDIP tool using an injection solution with the standard ratio (84 gallons SRS-SD, 3.5 liters TSI-DC, 78 pounds sodium bicarbonate, and 4599 gallons of conditioned water) at a pressure of 170 PSI.

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Well S137A monitoring results indicate successful TCE reduction to acceptable levels. Cis-DCE and vinyl chloride decreased as well, however rebounded in the second and fourth quarter, respectively. Well S139A initially had TCE, cis-DCE, and vinyl chloride reductions, however they all rebounded 60 days post-injection. The TOC retention time in both these wells was only 90 days, and sulfate reducing conditions rebounded in the quarters soon afterwards. During injections, the maximum TOC concentration in S137A, however was 520 mg/L when compared to 190 mg/L in S139A although the injection solution was the same. This greater TOC concentration contributed to a better reduction in TCE in S137A. Despite this small success, cis-DCE and vinyl chloride rebounded in both wells indicating not enough substrate was available to sustain anaerobic treatment. Additional substrate is likely needed in the area of these wells to continue degradation and complete the degradation pathway.

Freon 113 was reduced or did not change in these low-TCE wells; however baseline concentrations were below levels of concern.

6.2 Mid-range TCE Wells

Well S143A, located on the west side of the Phase II reactive zone near INJ- 10, had significant TCE and cis-DCE decreases, however rebound occurred in the second quarter. Vinyl chloride also rebounded above the baseline in the same quarter. Biotic degradation was apparent by the increased ethene and methane production, as well as a DHC population at target level. Despite these indicators, the TOC retention time in this well was two quarters, and sulfate reducing conditions rebounded in the same quarter. This indicates that not enough substrate was available to sustain anaerobic treatment. During injections, the water level increased by 1.25 ft, lower than other wells with similar distances from the injection point, indicating less impact from the injection. Additional substrate is likely needed in the area of this well to continue degradation and complete the degradation pathway.

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Well S141A and S160A, located on the northwest side of the reactive zone, had limited VOC reductions and resulted in a slight increase to cis-DCE and vinyl chloride levels in S141A. The TOC retention time in both these wells was less than 7 days and sulfate reducing conditions did not decrease to the desired 20 mg/L level. This indicates not enough substrate was available to sustain anaerobic treatment. The additional groundwater velocity investigation pointed to a higher than expected velocity in well S141A, over 45 ft/day compared with the 0.03 ft/day estimated during the substrate design (Locus Technologies, 2021). Based on additional lines of evidence, including nearby trenches that may serve as potential preferential pathways and the date when sediment filters from the 440 Wolfe basement sump were impacted with substrate, it is likely that the operation of the sump impacted the distribution of the injection solution at this location and other wells nearby (i.e. S139A and S160A). Thus, the design as proposed should be modified to account for potential hydraulic influences. A permeable reactive barrier or a recirculating system may be more appropriate if the 440 Wolfe sump continues to operate. Hydrogeological properties may also need to be further investigated as a basis of design.

Freon 113 was reduced or did not change in the mid-range TCE wells; however baseline concentrations were below levels of concern.

6.3 High TCE Wells

S138A is located near the center of the Phase II reactive zone and was also included in the Phase I reactive zone. TCE was reduced by 99.9%, from 6,800 to 10 µg/L. Cis-DCE was also initially reduced from 25,000 to 1,900 µg/L however rebounded in the second quarter. Vinyl chloride steadily increased from Phase II baseline through the second quarter, decreased in the third quarter and rebounded to 2,000 µg/L at the conclusion of Phase II monitoring. Compared to baseline conditions measured in Phase I, vinyl chloride increased over 2,00% over the course of Phase II. Freon 113 is present in relatively high concentrations in this well and also rebounded after some reduction. While rebounding occurred, trends still indicate reductive dechlorination is

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occurring at this well. The TOC retention time at S138A was four quarters, indicating substrate is still available to sustain anaerobic treatment. Additional SRS-SD was applied in the injection solution (140 pounds instead of 84), indicating the increase in SRS-SD sustained adequate TOC levels when compared to other monitoring locations with high levels of TOC. However, according to the SRS-SD vendor, Terra Systems, 1-3 years of TOC retention time is common at their sites, therefore additional substrate may be needed to address higher levels of COCs. Further monitoring is recommended to see if the remaining substrate may continue to aid in degradation. Otherwise, rebound may be due to a factor other than the lack of substrate. It should be noted that an oscillation in water levels was observed in the first two hours of injection. This oscillation was unique to S138A and could be indicative of a compromised well screen or casing. Further investigation of the well condition is recommended.

S140A exhibited the highest baseline concentrations of TCE, cis-DCE, and vinyl chloride within the Phase II treatability study area. Well S140A was also within the Phase I reactive zone. TCE reductions after the injection of INJ-8 were strong and concentrations decreased from 15,000 to <200 µg/L. The reporting limit for TCE was elevated because cis-DCE concentrations were high enough to cause interference. Samples were subsequently diluted by the laboratory, elevating the reporting limit of VOCs above levels needed to adequately assess performance. Cis-DCE concentrations have increased relatively since the first injections conducted in Phase I, and furthermore rebounded past Phase II baseline concentrations. Vinyl chloride has also increased throughout both phases of the EAB pilot studies. Freon 113 concentrations did not change substantially in this well during Phase II and are below action levels. The TOC retention time was 60 days and sulfate reducing conditions did not decrease to the desired 20 mg/L level. There is also an indication that iron reducing conditions were not reached, which is a precursor to other electron acceptors such as sulfate. This indicates not enough substrate was available to initiate reducing conditions that sustain anaerobic treatment, causing incomplete degradation pathways. S140A is located near S141A, which is suspected to be impacted by the 440 Wolfe sump and

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nearby trenches. It is possible that this nearby well is also subject to influence by hydraulic conditions and should be considered for design modifications. It should also be noted that the PAIP tool was used to deliver the injection solution at INJ-8 which cause the sustained pressure to dip slightly to 150 PSI.

VOC concentrations in S146A rebounded or ultimately increased to above baseline levels. Sulfate reducing conditions were achieved but also rebounded. Methane production above the target was short-lived at 30 days. Ethene decreased at this well, and the rebounding and lack of methane and ethene generation indicates reductive dechlorination was limited. Freon 113 was initially reduced but rebounded in the third and fourth quarters to reach 6,100 µg/L. Freon 113 inhibits reductive dechlorination by DHC (specifically *Dehalococcoides mccartyi*) in a concentration-dependent manner, causing cis-DCE stalls (Im J, 2019). In addition, the TOC retention time at this well was two quarters, another line of evidence hindering anaerobic treatment. The injection delivery tool used at nearby INJ-3 was the PAIP instead of the TDIP used at other injection locations. Using this tool, sustained pressures and flowrates for INJ-3 were limited at 70-100 PSI and 3.8 - 20.2 gpm with periodic tool clogging. Additional substrate will be needed in the area of this well to continue degradation, and it is recommended that the TDIP be used instead of the PAIP to ensure adequate injectate distribution. Addressing Freon 113 concentrations is also recommended.

S158A is a newly installed well located on the south end of the Phase II treatability study area. It was originally planned as an upgradient well, however the baseline TCE concentration of 8,100 µg/L extended the known horizontal extent of the plume southward (note that the concentration was qualified by the lab for exceeding the calibration range). After injections at nearby INJ-9, TCE was reduced by 99.9% to <10 µg/L. Cis-DCE peaked after injections, stabilizing at 22,000 µg/L for 90 days before decreasing to 44 µg/L in the third quarter and finally rebounding in the fourth quarter. Vinyl chloride followed a similar trend of decreasing in the third quarter and rebounding

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in the fourth quarter. The TOC retention time in this well is four quarters and contained 210 mg/L TOC at the time of the final sampling event, substantially above the recommended amount. Sulfate reducing conditions persisted through the performance monitoring period. The DHC microbial population was high, and gases were generated from fermentation and microbial activity as expected. Thus all signs point to an environment that sustains dechlorination, however monitoring VOC data does not indicate a degradation pathway is complete. Freon 113 was reduced to 79 µg/L from a baseline of 1,500 µg/L then rebounded in the fourth quarter. Because TOC concentrations are substantial, further monitoring is recommended in this well to understand whether rebounds persist.

7 Conclusions

Performance parameters monitored throughout the study were evaluated against the Test Goals identified in Section 4.1 of the Work Plan. Work Plan Test Goals are identified in italics below. Findings are described following each Test Goal.

- *Improve the monitoring network by adding three additional monitoring wells in the treatability study area for baseline and progress monitoring; one additional well at the upgradient end of the treatability study area, and two additional wells at the downgradient end of the treatability study area.*

  As seen in Figures 2 and 5, well S158A was installed in the upgradient zone of the treatability study area, within the ROI of INJ-9. Wells S159A and S160A were installed in the downgradient zone of the treatability area in the ROI of INJ-7 and INJ-4, respectively. Details of the monitoring well installation was discussed in the Injection Completion Report (Locus Technologies, 2021). In addition, three ad-hoc grab groundwater samples were collected immediately following injection (TW-1, TW-2, TW-3) and analyzed for VOCs to characterize the horizontal extent of the source area further. These wells were included in the baseline and post-injection (progress) monitoring as discussed in Section

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4.2. Results from these new Phase II wells and the expanded monitoring network are included in Section 4.

◇ *Collect injection pressure data at varying flow rates to refine injection procedures for future full-scale implementation.*

The collection of pressure and flowrate data provided useful information on effectiveness of direct push injection tooling, sustainable delivery rates, and site-specific fluid acceptance capacity. Overall, the TDIP tooling provided flexibility in the field for delivering the reagent at various pressures and flow rates. General injection flowrates of up to 26 gpm were achieved at sustained pressures of 170 PSI across the injection column. Similar rates were observed for the delivery of loading volumes of up to 50% above design value. No daylighting or indication of fracturing was observed with the implemented injection techniques.

◇ *Gauge water levels surrounding injection points to measure the radius of influence (ROI) of the injection.*

Water levels were measured continuously as injections were conducted in the treatability area. These water levels were then graphed to visualize the impact of injection and determine the actual ROI, as discussed in Section 4.2.2. An ROI of 20 feet or greater was measured for ten out of twelve injections. The average ROI was estimated at 33 feet, based on qualifiable data (see Section 4.2.3). However, due to the extended injection activity period, in relation to Phase I study, a ROI greater than 20 feet may have been influenced by hydraulic disturbances resulting from the lateral displacement of resident groundwater. Therefore, a ROI of 20-30 feet should be retained for future implementations.

◇ *Increase carbon availability across the study area to decrease electron acceptor profile, mitigate VOC rebounds, and support the repopulation of inoculated microbial cultures.*

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Carbon availability varied across the reactive zone, shown by the TOC retention times in Figure 6. Wells S159A, S158A and S138A, which experienced the longest TOC retention times, may benefit from additional performance monitoring to evaluate the degree to which VOC rebounding will occur and the longevity of the repopulated DHC. In other areas of the reactive zone, additional carbon may be necessary to avoid rebounds, competition from other electron acceptors, and promote microbial growth.

The injection of SRS-SD resulted in a TOC increase from 1.8 mg/L to an average of 120 mg/L by end of second week of injections. Average concentration gradually decreased following this period and up to 77% by second quarter (28 mg/L). Overall, TOC retention rates suggest an increase in injection frequency or dosing concentration may be required to maintain target TOC across the reactive zone. However, the poor retention identified at specific locations may attributed to the effects of existing preferential pathways and high utilization rate for biotic degradation.

- *Increase Dehalococcoides (DHC) populations where populations have declined below the target of 1 x 10^6 cells/L (1 x 10^3 cells/mL) based on third quarter monitoring: S146A and S140A.*

  Phase II injections successfully repopulated DHC at wells S146A and S140A, which remained above the screening criterion through the entirety of the Phase II monitoring period. The Phase II evaluation used a more conservative screening threshold (>1x10^4 cells/mL DHC), recommended by Microbial Insights and recent studies. DHC populations surpassed 1x10^4 cells/mL in the reactive zone (confirmed during the Phase II 90-day monitoring event), except for well S160A which narrowly met the DHC target. By the third quarter, wells S159A and S160A decreased to below the screening criterion, with fourth quarter DHC populations of 2x10^3 cells/mL and 4.7x10^3 cells/mL, respectively. This population decline appeared to have minimal effect on the performance at S159A based

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on the VOC concentrations; however, low DHC populations compounded with low TOC at S160A indicates insufficient injection solution was present in this well.

- *Implement a gridded injection, expanding reactive zone to reduce the effects of boundary conditions (the effects of untreated areas on treated areas) and migration of VOCs to downgradient areas.*

  Twelve injections were planned in a triangular grid with 20 ft ROIs. The planned triangular grid is seen in Figure 4 of the Work Plan (Locus Technologies, 2020). After field verifications and discussions with the EPA, three planned injections (INJ-10, INJ-9, and INJ-6) were moved due to field constraints (see more details in the Injection Completion Report) which resulted in a deviation from the originally planned triangle grid. Figure 5 shows the final locations of the injections with the estimated ROI of 20 ft. Injections circles are adjacent to each other in most areas, however when the average actual ROI of 33 feet is incorporated, the injections overlap. The overlapping of injections helps reduce the effects of boundary conditions. Monitoring locations inside the reactive zone were sampled throughout the duration of Phase II study to further evaluate the boundary conditions. Downgradient wells S025A and S088A were monitored for adverse groundwater impacts and migration of VOCs. No adverse groundwater impacts were detected at downgradient wells as discussed in Section 4.11.

- *Implement a gridded injection based on a 20-foot ROI, verified with field observations such as water levels or appearance.*

  As previously discussed, twelve injections were planned in a triangular grid with 20 ft ROIs; however, field constraints caused some of the locations to move resulting in three injections to the east, west, and south to deviate from the 20-foot ROI grid. The actual ROIs were greater and the average ROI was 33 feet as verified with water levels and discussed in Section 4.2.3.

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- *Determine the effectiveness of SRS-SD and TSI-DC bioaugmentation culture at promoting anaerobic degradation of chlorinated ethenes and Freon 113 at S140A and S141A.*

  The injection solution of SRS-SD and TSI-DC clearly promoted anaerobic degradation of chlorinated ethenes in the high-TCE and low-TCE wells, demonstrated by fluctuating VOC concentrations and the sharp decline of TCE in the reactive zone. At the mid-range TCE wells in the northwest of the reactive zone, particularly S141A and S160A, the TOC retention time was very short (approximately 1 week), and reductive dechlorination of VOCs was less apparent. Overall, Freon 113 decreased at the majority of wells in the reactive zone, and Freon 113 concentrations were below the action level of 1,200 µg/L at all wells in the fourth quarter, except for S146A.

- *Refine in situ remedial parameters for full-scale implementation.*

  TOC retention times and EAB performance were affected by the hydraulic gradient and the existence of high permeability zones within the Phase II treatability study area. Thus, in situ parameters could not be fully refined and a modification of the design is recommended to accommodate these hydraulic influences. However, assuming direct push injections are used again, ROI and delivery techniques evaluations resulted in a recommendation of the TDIP tool over the PAIP. Phase II sustained pressures of 170 PSI did not cause daylighting whereas pressures below that did not result in adequate substrate distribution. Daylighting occurred above this pressure in Phase I, thus it recommended to continuing applying a pressure of around 170 PSI in the future. Using the Phase II pressure, an average ROI of 33 feet was observed, however the use of a 20-foot ROI is recommended due to potential displacements (see Section 4.2.3).

- *Demonstrate that injection of this substrate would not create unintended adverse impacts to groundwater.*

  Manganese and arsenic increased in the reactive zone as a result of the reducing conditions caused by the EAB injections. Monitoring of downgradient wells however,

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showed that elevated manganese and arsenic were not found outside the reactive zone throughout the performance monitoring period. Therefore, unintended adverse impacts to groundwater were not encountered. Further details can be found in Section 4.11.

8 Recommendations

The study findings have indicated that a single injection of SRS-SD and TSI-DC was effective in promoting anaerobic biodegradation of VOCs at limited locations. However, the majority of the treatment area did not complete the degradation pathway due to limited TOC (carbon availability). Thus, source area treatment should continue, and the following recommendations should be implemented in the future remedy design:

- Conduct an additional pilot, Phase III, in the treatability study area for continued source treatment, and expand the treatment area to areas where VOCs persist. Because post-injection monitoring of Phase II is still ongoing, it is recommended to develop the work plan after the two-year monitoring event (scheduled for Q4 2022) and to consider the data from that event in the design of Phase III.
- During Phase II grab sampling, the lateral extent of the plume was discovered to reach further south. The monitoring network should be expanded to include more wells on the south side of the reactive zone and potentially more injections if baseline sampling of the new wells provides new information on the distribution of concentrations.
- Increase carbon availability across study area to decrease electron acceptor profile, mitigate VOC rebounds, and support the repopulation of inoculated microbial cultures. Based solely on TOC data, the results suggest an increase in injection frequency or dosing concentration may be required for a 12 month design cycle. The SRS-SD vendor Terra Systems has recommended a 12 month to 3 year design cycle.

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- Observed delivery rates and TDIP tooling are recommended for future implementations, if other delivery parameters (i.e. injection depth, volumes, amendment material, etc.) remain the same.
- For further expansions of the EAB treatment area, implement a gridded injection based on a 20 to 30-foot radius of influence. Ensure the injections can be monitored adequately from all available monitoring wells or adding new wells if necessary.
- Conduct additional EAB performance groundwater monitoring at S138A and S158A to assess additional degradation by remaining TOC.
- The functional genes VCR and BVC do not appear to accurately reflect the site conditions and are not recommended to be used in the future as indicator parameters.
- Attempt to reduce elevated reported limits to enable comparison with performance indicators.
- Evaluate the physical well condition at S138A due to observed oscillations during injection water level gauging.
- Address Freon 113 concentrations at S146A that may be contributing to rebounding.
- Further refine in situ remedial parameters for full-scale implementation.
- Refine ROI of reagents by conducting tracer studies or similar studies.
- Based on the velocity investigation, modify the design to account for hydraulic conditions caused by extraction wells, sump, and potential preferential pathways in the treatability area. Modifications may include targeting zones within the A-aquifer by adjusting delivery techniques or the incorporation of recirculation techniques. A less viscous substrate may be needed for recirculation design which would require more treatment studies. Modifications could also include the incorporation of secondary treatment technologies such reactive barriers or phytotechnologies. Phytotechnologies have been demonstrated to perform successfully at a nearby site with similar characteristics. The degradation

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mechanism (aerobic vs anaerobic) would need to be considered when considering its feasibility. A site visit is planned for assessing the feasibility further.

- Site-specific hydrogeologic conditions may also need further investigation if needed for the basis of design and targeted treatment. Injection back pressures could be evaluated to gauge groundwater transmissivity and areas of resistance. It is more desirable to target injections in clay lenses, reflected by higher back pressures rather than lower pressure depths that indicate higher groundwater transmissivity or potential for substrate loss. In addition, a membrane interface probe could be incorporated in the next design to characterize the extent of the VOC and identify migration pathways.
- Consider expanding treatment to the area north of the current treatability area, at 815 Stewart Drive. A separate work plan for this area should be developed with information from the Phase III pilot.

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TABLES

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TABLE 1
COMPLETED IN-SITU INJECTION QUANTITIES AND PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Injection Location	Injection Date	Injection Depth (ft-bgs)	Injection Method	SRS-SD (gal)	TSI-DC (L)	Sodium Bicarbonate (lbs)	Water (gal)	Total Injected (gal)	Sustained Pressure (PSI)	Flow Rate (gpm)	Daylighting Monitored Wells
INJ-3	11/10/2020	16 - 36	PAIP	84	3.5	75	4,599	4,688	70 - 100	3.8 - 20.2	S138A, S137A, S146A, S158A
INJ-8	11/11/2020	15 - 35	PAIP	84	3.5	75	4,599	4,688	150 - 170	19.5 - 22.5	S138A, S140A, S145A, S158A
INJ-10	11/11/2020 - 11/12/2020	15 - 35	TDIP	84	3.5	75	4,599	4,688	170	21.7 - 26.6	S142A, S144A, S145A
INJ-2	11/12/2020	15 - 35	TDIP	84	3.5	75	4,599	4,688	170	21.7 - 24.4	S136A, S137A, S138A, S146A
INJ-7	11/12/2020 - 11/13/2020	15 - 35	TDIP	84	3.5	76.5	4,599	4,688	170	15.4 - 24.4	S138A, S140A, S141A, S160A
INJ-1	11/13/2020	15 - 35	TDIP	84	3.5	78	4,599	4,688	170	21.7 - 23.4	S136A, S137A, S159A
INJ-9	11/16/2020	15 - 35	TDIP	84	3.5	116.3	6,898	6,989	170	22.4 - 25.0	S158A, S146A, S140A, S145A
INJ-5	11/17/2020 - 11/18/2020	15 - 35	TDIP	140	3.5	78	4,599	4,744	170	5.0 - 22.8	S138A, S140A, S146A, S158A
INJ-12	11/17/2020	15 - 35	TDIP	84	3.5	78	4,599	4,688	170	4.0 - 23.4	S143A, S145A
INJ-11	11/18/2020	15 - 35	TDIP	84	3.5	78	4,599	4,688	170	20.9 - 25.5	S140A, S141A, S143A, S145A
INJ-4	11/19/2020	15 - 35	TDIP	84	3.5	78	4,599	4,688	170	20.2 - 24.4	S137A, S139A, S159A, S160A
INJ-6	11/19/2020 - 11/20/2020	15 - 35	TDIP	140	3.5	78	6,080	6,080	45 - 175	10.1 - 23	S136A, S137A, S159A

NOTES:
ft-bgs = Feet below ground surface
gal = Gallon
gpm = Gallons per minute
lbs = Pounds
L = Liters
PAIP = Pressure activated injection probe
PSI = pounds per square inch
SRS-SD = Slow Release Substrate (SRS®) - Small Droplet Emulsified Vegetable Oil Substrate
TDIP = Top-down injection probe
TSI-DC = Terra Systems Inc. Dehalococcoides mccartyii Bioaugmentation Culture®

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S049A	S049A	S049A	S049A	S049A	S049A	S137A
DATE		11/16/2020	11/16/2020	11/18/2020	11/18/2020	11/20/2020	11/20/2020	11/11/2020
TIME		13:02	13:20	13:30	13:46	8:46	9:05	13:00
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	Clear	--	Clear	--	Clear	--
DO	mg/L	--	0.86	--	1.44	--	1.03	--
Ferrous Iron	ft-bgs	--	0	--	0	--	0	--
Groundwater level	mg/L	9.45	--	9.5	--	9.2	--	12.03
Methane	ppm	0	--	410	--	780	--	--
ORP	mV	--	-77.6	--	-41.2	--	5.8	--
pH	--	--	6.77	--	6.76	--	6.81	--
Specific Conductivity	µS/cm	--	1432	--	1421	--	1424	--
Temperature	°C	--	20.7	--	20.6	--	20.3	--
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	--	--	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S137A	S137A	S137A	S137A	S137A	S137A	S137A
DATE		11/11/2020	11/12/2020	11/12/2020	11/13/2020	11/13/2020	11/16/2020	11/16/2020
TIME		13:05	15:18	15:39	16:10	16:25	13:30	13:45
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	--	Cloudy white	--	Cloudy white	--	Milky, odor
DO	mg/L	1.18	--	1.23	--	0.88	--	0.77
Ferrous Iron	ft-bgs	0	--	0.5	--	--	--	1
Groundwater level	mg/L	--	5.9	--	9.95	--	12	--
Methane	ppm	--	--	--	0	--	75	--
ORP	mV	55.7	--	-74.2	--	-124.1	--	-168.4
pH	--	7.04	--	7	--	6.88	--	6.63
Specific Conductivity	µS/cm	1362	--	1494	--	--	--	1436
Temperature	°C	22.5	--	22.1	--	21.8	--	22.6
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	Used to monitor INJ-2 on 11/12	Used to monitor INJ-2 on 11/12	Due to injection	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S137A	S137A	S137A	S137A	S137A	S137A	S137A
DATE		11/17/2020	11/17/2020	11/18/2020	11/18/2020	11/19/2020	11/19/2020	11/20/2020
TIME		12:45	13:15	13:50	14:15	16:58	17:08	9:12
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	Milky	--	Milky	--	Milky	--
DO	mg/L	--	0.77	--	0.9	--	0.8	--
Ferrous Iron	ft-bgs	--	1.5	--	2.5	--	3.5	--
Groundwater level	mg/L	12.25	--	9.85	--	--	--	--
Methane	ppm	210	--	55	--	0	--	--
ORP	mV	--	-191.6	--	-178.2	--	-171.5	--
pH	--	--	6.54	--	6.3	--	6.26	--
Specific Conductivity	µS/cm	--	1334	--	1251	--	1181	--
Temperature	°C	--	22.2	--	22.1	--	21.8	--
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	--	--	Water level not measured, active monitoring location.	Monitoring INJ-6 sampled during INJ progress	Not measured, soil vapor cap open. Water level not measured, active INJ monitoring.

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S137A	S138A	S138A	S138A	S138A	S138A	S138A
DATE		11/20/2020	11/11/2020	11/11/2020	11/12/2020	11/12/2020	11/13/2020	11/13/2020
TIME		9:22	8:24	16:40	17:24	17:37	14:45	15:00
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	Milky/odor	clear/H2s odor	--	--	Sulfur odor	--	Light cloudy white
DO	mg/L	1.01	0.71	--	--	0.74	--	0.78
Ferrous Iron	ft-bgs	2	1	--	--	--	--	1
Groundwater level	mg/L	--	12.65	13.09	10.81	--	11.4	--
Methane	ppm	--	--	--	15	--	120	--
ORP	mV	-153.8	-221.5	--	--	-201.2	--	-193.8
pH	--	6.25	6.96	--	--	6.91	--	6.92
Specific Conductivity	µS/cm	1136	1401	--	--	1498	--	1518
Temperature	°C	21.8	22.1	--	--	22.3	--	22.1
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	Monitor INJ-6 - sampled during INJ progress	--	--	--	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
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TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S138A	S138A	S138A	S138A	S138A	S138A	S138A
DATE		11/16/2020	11/16/2020	11/17/2020	11/18/2020	11/18/2020	11/19/2020	11/19/2020
TIME		15:50	16:05	0:00	15:56	16:14	15:58	16:15
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	6906	--	--	--	--
Appearance/odor	mg/L	--	Clear/odor	Milky/odor present	--	Milky/odor	--	Milky
DO	mg/L	--	0.7	0.66	--	0.7	--	0.7
Ferrous Iron	ft-bgs	--	1	2	--	3	--	3
Groundwater level	mg/L	12.7	--	--	11.05	--	10.45	--
Methane	ppm	330	--	--	240	--	360	--
ORP	mV	--	-223.8	-180.5	--	-184	--	-211.2
pH	--	--	6.05	6.66	--	6.7	--	6.61
Specific Conductivity	µS/cm	--	1450	1848	--	1680	--	1697
Temperature	°C	--	22.4	21.7	--	21.8	--	21.9
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	Alkalinity field method as CaCO2; Alk P=0	--	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
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TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S138A	S138A	S139A	S139A	S139A	S139A	S139A
DATE		11/20/2020	11/20/2020	11/11/2020	11/11/2020	11/12/2020	11/12/2020	11/13/2020
TIME		11:28	11:45	15:15	15:30	15:35	15:50	13:25
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	Milky/odorous	--	Milky	--	oudy white/H2s od	--
DO	mg/L	--	0.71	--	0.84	--	1.13	--
Ferrous Iron	ft-bgs	--	1.5	--	2	--	2.5	--
Groundwater level	mg/L	12	--	12	--	10.41	--	11.45
Methane	ppm	440	--	--	--	700	--	0
ORP	mV	--	-233.5	--	-102.7	--	-110.5	--
pH	--	--	6.57	--	6.61	--	6.6	--
Specific Conductivity	µS/cm	--	1590	--	1611	--	1706	--
Temperature	°C	--	21.9	--	22.3	--	22.2	--
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	--	--	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
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TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S139A	S139A	S139A	S139A	S139A	S139A	S139A
DATE		11/13/2020	11/16/2020	11/16/2020	11/16/2020	11/16/2020	11/17/2020	11/17/2020
TIME		13:40	13:13	13:45	14:05	14:50	13:10	13:33
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	4340	--	7752	--	--	--
Appearance/odor	mg/L	Cloudy white	Clear/odor	--	Cloudy/Bubbly/odo	--	--	Cloudy w/ dark tin
DO	mg/L	0.86	0.76	--	0.72	--	--	0.74
Ferrous Iron	ft-bgs	2	0	--	3	--	--	2
Groundwater level	mg/L	--	--	12.77	--	13.36	12.7	--
Methane	ppm	--	--	930	--	115	1150	--
ORP	mV	-158.7	-94.2	--	-189.5	--	--	-210
pH	--	6.62	6.91	--	6.33	--	--	6.4
Specific Conductivity	µS/cm	1696	1401	--	1590	--	--	1588
Temperature	°C	22.2	22.8	--	23.3	--	--	22.5
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	Alkalinity field method as CaCO2; Alk P=0	High methane gas @ wellhead	Field method as CaCO2; High methane gas@wellhead. High methane gas @ wellhead.	Hand written water level is not clear, could be 15.36.	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
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TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S139A	S139A	S139A	S139A	S139A	S139A	S140A
DATE		11/18/2020	11/18/2020	11/19/2020	11/19/2020	11/20/2020	11/20/2020	11/11/2020
TIME		14:10	14:30	14:01	14:11	9:25	9:45	8:45
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	Clear/odor	--	Tinted/odor	--	Clear, grey	--
DO	mg/L	--	0.75	--	0.8	--	1	--
Ferrous Iron	ft-bgs	--	2.5	--	3.5	--	4	--
Groundwater level	mg/L	11.35	--	--	--	12.1	--	12.31
Methane	ppm	1100	--	--	--	680	--	--
ORP	mV	--	-206.5	--	-220.3	--	-220.7	--
pH	--	--	6.39	--	6.51	--	6.51	--
Specific Conductivity	µS/cm	--	1646	--	1622	--	1631	--
Temperature	°C	--	23	--	22.4	--	22.6	--
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	Active monitoring location	--	--	--	Used for monitoring mounding, INJ#8

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S140A	S140A	S140A	S140A	S140A	S140A	S140A
DATE		11/11/2020	11/11/2020	11/13/2020	11/13/2020	11/16/2020	11/16/2020	11/16/2020
TIME		17:20	17:35	15:38	15:50	16:45	17:00	0:00
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	Cloudy	--	--	Light cloudy	--	--	Clear/bubbly
DO	mg/L	0.073	--	--	1.15	--	--	0.82
Ferrous Iron	ft-bgs	1.5	--	--	2	--	--	2.5
Groundwater level	mg/L	--	13.65	12.25	--	--	--	--
Methane	ppm	--	--	15	--	--	15	--
ORP	mV	-161.8	--	--	-123.5	--	--	-165.3
pH	--	7.08	--	--	7.03	--	--	6.92
Specific Conductivity	µS/cm	1730	--	--	1710	--	--	1623
Temperature	°C	21.8	--	--	21.7	--	--	22
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	Used for monitoring mounding, INJ#8	Used for monitoring mounding, INJ#8	--	--	water level not measured; used to monitor injection 9 - sampled at end of injection	Used to monitor injection 9 - sampled at end of injection	Used to monitor injection 9 - sampled at end of injection

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S140A	S140A	S140A	S140A	S140A	S140A	S140A
DATE		11/17/2020	11/17/2020	11/18/2020	11/18/2020	11/19/2020	11/19/2020	11/20/2020
TIME		15:25	15:40	16:40	16:50	16:30	16:50	13:00
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	Clear	--	Clear	--	--	--
DO	mg/L	--	0.69	--	0.87	--	0.73	--
Ferrous Iron	ft-bgs	--	2	--	2.5	--	2	--
Groundwater level	mg/L	--	--	--	--	12	--	12.67
Methane	ppm	--	--	--	--	410	--	440
ORP	mV	--	-175	--	-201.1	--	-204.8	--
pH	--	--	6.92	--	6.66	--	6.87	--
Specific Conductivity	µS/cm	--	1631	--	1817	--	1556	--
Temperature	°C	--	21.8	--	22	--	21.9	--
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	Soil vapor cap open; light to mild rain. Water level not measured; Light to mild rain.	Light to mild rain; gauged to monitor INJ-5 - sampled during injection process low influence	Methane not measured, soil vapor cap open. Water level not measured, in use for monitoring injection	Injection monitoring location x INJ-11 - sampled during INJ. in progress	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S140A	S141A	S141A	S141A	S141A	S141A	S141A
DATE		11/20/2020	11/11/2020	11/11/2020	11/13/2020	11/13/2020	11/16/2020	11/16/2020
TIME		13:12	16:05	16:20	15:18	15:35	15:35	15:48
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	Clear grey tint	--	Clear	--	Cloudy white	--	Clear/bubbly
DO	mg/L	0.73	--	0.87	--	0.8	--	0.77
Ferrous Iron	ft-bgs	2	--	0	--	0	--	0
Groundwater level	mg/L	--	13.66	--	12.81	--	13.95	--
Methane	ppm	--	--	--	0	--	530	--
ORP	mV	-194.8	--	96.9	--	21.8	--	-8.4
pH	--	6.87	--	6.76	--	6.74	--	6.77
Specific Conductivity	µS/cm	1666	--	1468	--	1776	--	1726
Temperature	°C	22.2	--	21.8	--	22.1	--	22.4
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	--	--	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S141A	S141A	S141A	S141A	S141A	S141A	S141A
DATE		11/17/2020	11/17/2020	11/18/2020	11/18/2020	11/19/2020	11/19/2020	11/20/2020
TIME		14:10	14:25	15:30	15:40	14:58	15:15	10:55
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	Clear	--	--	--	Clear	--
DO	mg/L	--	0.97	--	0.87	--	0.87	--
Ferrous Iron	ft-bgs	--	0	--	0	--	0	--
Groundwater level	mg/L	12.85	--	--	--	12.79	--	13.48
Methane	ppm	55	--	--	--	85	--	85
ORP	mV	--	-60.5	--	-72.2	--	-47.5	--
pH	--	--	6.79	--	6.78	--	6.76	--
Specific Conductivity	µS/cm	--	1722	--	1773	--	1782	--
Temperature	°C	--	21.1	--	21.8	--	22.1	--
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	Water level not measured, gauged w/ logger INJ-11. Methane not measured, soil vapor cap open.	Used to monitor INJ-11 - sampled during injection progress	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S141A	S143A	S143A	S143A	S143A	S143A	S143A
DATE		11/20/2020	11/12/2020	11/12/2020	11/13/2020	11/13/2020	11/16/2020	11/16/2020
TIME		11:12	16:10	16:20	13:43	14:00	14:20	14:40
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	Cloudy	--	Cloudy white	--	oudy white/H2s od	--	Cloudy/bubbly
DO	mg/L	0.78	--	0.8	--	0.84	--	0.71
Ferrous Iron	ft-bgs	0	--	0	--	0	--	0
Groundwater level	mg/L	--	12.55	--	12.35	--	12.75	--
Methane	ppm	--	0	--	50	--	55	--
ORP	mV	-60	--	47.8	--	-4.7	--	-186.7
pH	--	6.76	--	6.99	--	7.06	--	6.92
Specific Conductivity	µS/cm	1956	--	1530	--	1463	--	1404
Temperature	°C	22.3	--	22.3	--	22.6	--	23.1
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	--	--	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S143A	S143A	S143A	S143A	S143A	S143A	S143A
DATE		11/17/2020	11/17/2020	11/17/2020	11/18/2020	11/18/2020	11/20/2020	11/20/2020
TIME		14:30	14:50	0:00	14:50	15:05	10:15	10:30
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	--	--	--	Clear	--	Clear
DO	mg/L	--	--	0.77	--	0.74	--	0.76
Ferrous Iron	ft-bgs	--	--	0	--	0	--	0.5
Groundwater level	mg/L	--	--	--	--	--	12.46	--
Methane	ppm	--	115	--	50	--	95	--
ORP	mV	--	--	-124.1	--	-181.5	--	-207.2
pH	--	--	--	7.36	--	7.35	--	7.25
Specific Conductivity	µS/cm	--	--	1486	--	1338	--	1347
Temperature	°C	--	--	21.1	--	22.1	--	23.1
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	Water level not measured	--	--	water level not measured, gauged w/ logger. Used to monitor INJ-11 - sampled during injection progress.	Used to monitor INJ-11 - sampled during injection progress	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S145A	S145A	S146A	S146A	S146A	S146A	S146A
DATE		11/12/2020	11/12/2020	11/11/2020	11/11/2020	11/11/2020	11/12/2020	11/12/2020
TIME		9:05	9:20	8:27	16:21	16:35	16:27	16:40
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	Slightly cloudy	--	Milky cloudy	--	--	Cloudy white
DO	mg/L	--	0.91	--	0.78	--	--	1.23
Ferrous Iron	ft-bgs	--	--	--	1	--	--	2.5
Groundwater level	mg/L	13	--	12.19	--	12.34	9.65	--
Methane	ppm	--	--	--	--	--	75	--
ORP	mV	--	-110	--	-64.7	--	--	-105.2
pH	--	--	7.04	--	6.94	--	--	6.88
Specific Conductivity	µS/cm	--	1460	--	1262	--	--	1422
Temperature	°C	--	21.8	--	21.5	--	--	21.7
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	Used to monitor INJ #10 ~45' from INJ PT	Used to monitor INJ #10 ~45' from INJ PT	--	--	--	Used to monitor INJ-2	Used to monitor INJ-2

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S146A	S146A	S146A	S146A	S146A	S146A	S146A
DATE		11/13/2020	11/13/2020	11/16/2020	11/16/2020	11/16/2020	11/17/2020	11/17/2020
TIME		14:18	14:35	12:00	16:25	0:00	16:18	16:37
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	1893
Appearance/odor	mg/L	--	Cloudy white	--	--	Cloudy/bubbly	--	Cloudy/odor/bubbl
DO	mg/L	--	0.74	--	--	0.75	--	0.68
Ferrous Iron	ft-bgs	--	2	--	--	3.5	--	2.5
Groundwater level	mg/L	11.21	--	--	--	--	--	--
Methane	ppm	410	--	--	--	--	--	--
ORP	mV	--	-156.1	--	--	-184.4	--	-189.3
pH	--	--	6.84	--	--	6.59	--	6.57
Specific Conductivity	µS/cm	--	1402	--	--	1294	--	1311
Temperature	°C	--	21.8	--	--	21.9	--	21.8
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	--	water level not measured; used for monitoring injection 9 - sampled at end of injection	Used for monitoring INJ-9 - sampled at end of injection	Soil vapor cap open; light to mild rain	Light to mild rain; gauged to monitor INJ-5 during injection process. Gauged to monitor INJ-5 - sampled during injection process. Alkalinity field method as CaCO2; Alk P=0.

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S146A	S146A	S146A	S146A	S146A	S146A	S147A
DATE		11/18/2020	11/18/2020	11/19/2020	11/19/2020	11/20/2020	11/20/2020	11/19/2020
TIME		15:40	15:57	15:45	15:58	11:10	11:30	14:45
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	Cloudy/odor	--	Milky/odorous	--	Milky w/ grey tint	--
DO	mg/L	--	0.8	--	0.74	--	0.77	--
Ferrous Iron	ft-bgs	--	3.5	--	3	--	3	--
Groundwater level	mg/L	10.4	--	10.5	--	11.4	--	12.28
Methane	ppm	55	--	430	--	840	--	35
ORP	mV	--	-178.2	--	-191.7	--	-192.4	--
pH	--	--	6.6	--	6.67	--	6.29	--
Specific Conductivity	µS/cm	--	1342	--	1350	--	1318	--
Temperature	°C	--	21.9	--	21.9	--	22	--
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	--	--	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S147A	S158A	S158A	S158A	S158A	S158A	S158A
DATE		11/19/2020	11/11/2020	11/11/2020	11/11/2020	11/12/2020	11/12/2020	11/13/2020
TIME		14:58	8:30	17:00	17:11	16:45	17:00	15:02
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	Cloudy/odor	--	Cloudy	--	--	Clear	--
DO	mg/L	0.8	--	0.79	--	--	0.89	--
Ferrous Iron	ft-bgs	1	--	0	--	--	0	--
Groundwater level	mg/L	--	12.25	--	12.44	11.68	--	12.2
Methane	ppm	--	--	--	--	350	--	125
ORP	mV	-196.2	--	-65.3	--	--	17.1	--
pH	--	6.95	--	6.96	--	--	6.97	--
Specific Conductivity	µS/cm	1530	--	1383	--	--	1314	--
Temperature	°C	22.7	--	22.4	--	--	22.5	--
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	Used for monitoring INJ#3 and INJ#8	Used for monitoring INJ#3 and INJ#8	Used for monitoring INJ#3 and INJ#8	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S158A	S158A	S158A	S158A	S158A	S158A	S158A
DATE		11/13/2020	11/16/2020	11/16/2020	11/16/2020	11/16/2020	11/17/2020	11/17/2020
TIME		15:15	12:00	16:30	16:42	0:00	15:05	15:15
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	Clear	--	--	--	Cloudy white	--	Milky
DO	mg/L	1.29	--	--	--	1.64	--	0.91
Ferrous Iron	ft-bgs	0	--	--	--	0.5	--	0
Groundwater level	mg/L	--	--	--	--	--	--	--
Methane	ppm	--	--	--	15	--	--	--
ORP	mV	-16.6	--	--	--	-74.5	--	-94.7
pH	--	7.04	--	--	--	6.95	--	6.95
Specific Conductivity	µS/cm	1392	--	--	--	1783	--	1682
Temperature	°C	22.4	--	--	--	22.4	--	22.2
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	water level not measured; used for monitoring injection 9 - sampled at end of injection	Used for monitoring INJ-9 sampled at end of injection	Used for monitoring INJ-9 sampled at end of injection	Light to mild rain; gauged to monitor INJ-5 during injection process - low influence	Light to mild rain; gauged to monitor INJ-5 during injection process - low influence. Gauged to monitor INJ-5 - sampled during injection process low influence.

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S158A	S158A	S158A	S158A	S158A	S158A	S159A
DATE		11/18/2020	11/18/2020	11/19/2020	11/19/2020	11/20/2020	11/20/2020	11/11/2020
TIME		16:20	16:32	16:15	16:35	11:50	12:19	15:30
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	Milky	--	Cloudy	--	Cloudy	--
DO	mg/L	--	0.81	--	0.69	--	0.65	--
Ferrous Iron	ft-bgs	--	0.5	--	1	--	2	--
Groundwater level	mg/L	11.4	--	11.9	--	11.75	--	13.6
Methane	ppm	240	--	410	--	210	--	--
ORP	mV	--	-371.3	--	-227.9	--	-168.4	--
pH	--	--	6.73	--	6.5	--	6.41	--
Specific Conductivity	µS/cm	--	1654	--	1632	--	1609	--
Temperature	°C	--	22	--	22.3	--	22.4	--
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	--	--	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S159A	S159A	S159A	S159A	S159A	S159A	S159A
DATE		11/11/2020	11/12/2020	11/12/2020	11/13/2020	11/13/2020	11/17/2020	11/17/2020
TIME		15:40	15:53	16:05	15:55	16:10	13:30	13:50
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	Clear	--	--	--	Cloudy white	--	Clear
DO	mg/L	1.13	--	-0.9	--	1.65	--	0.78
Ferrous Iron	ft-bgs	0	--	0	--	0	--	0
Groundwater level	mg/L	--	11.6	--	10.61	--	13.5	--
Methane	ppm	--	50	--	0	--	155	--
ORP	mV	11.6	--	-40.2	--	5.3	--	-138.5
pH	--	7.02	--	6.97	--	6.96	--	6.9
Specific Conductivity	µS/cm	1322	--	1425	--	1435	--	1403
Temperature	°C	22.2	--	22.1	--	22.5	--	22.4
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	--	Due to injection	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S159A	S159A	S159A	S159A	S159A	S159A	S160A
DATE		11/18/2020	11/18/2020	11/19/2020	11/19/2020	11/20/2020	11/20/2020	11/11/2020
TIME		14:30	14:48	14:20	14:35	9:55	10:05	15:44
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	Clear	--	Milky grey	Milky	--	--
DO	mg/L	--	0.92	--	2.18	0.78	--	--
Ferrous Iron	ft-bgs	--	0	--	0	0.5	--	--
Groundwater level	mg/L	1245	--	NM	--	--	--	13.78
Methane	ppm	125	--	95	--	--	--	--
ORP	mV	--	-133.5	--	-46.8	-232.4	--	--
pH	--	--	6.84	--	7.02	6.86	--	--
Specific Conductivity	µS/cm	--	1358	--	1617	2410	--	--
Temperature	°C	--	22.8	--	21.7	21.5	--	--
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	Monitoring INJ-6 sampled during INJ progress. Active MNTR location.	Monitoring INJ-6 sampled during INJ progress	Monitoring INJ-6 sampled during active injection.	Methane not measured, soil vapor cap open. Water level not measured, active INJ monitoring.	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S160A	S160A	S160A	S160A	S160A	S160A	S160A
DATE		11/11/2020	11/12/2020	11/12/2020	11/13/2020	11/13/2020	11/16/2020	11/16/2020
TIME		16:00	17:00	17:19	14:00	14:15	15:18	15:30
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	Silty / Cloudy	--	Cloudy white & silt	--	Clear	--	Clear
DO	mg/L	0.81	--	1.71	--	1.98	--	0.77
Ferrous Iron	ft-bgs	0	--	0.5	--	0	--	0.5
Groundwater level	mg/L	--	9.6	--	12.6	--	14.04	--
Methane	ppm	--	50	--	10	--	3000	--
ORP	mV	-0.9	--	19.7	--	27.4	--	-134.2
pH	--	6.79	--	6.83	--	6.88	--	6.56
Specific Conductivity	µS/cm	1828	--	2137	--	2083	--	1681
Temperature	°C	21.4	--	22.3	--	21.8	--	21.9
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	--	--	--	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S160A	S160A	S160A	S160A	S160A	S160A	S160A
DATE		11/17/2020	11/17/2020	11/18/2020	11/18/2020	11/19/2020	11/19/2020	11/20/2020
TIME		14:00	14:10	15:05	15:25	15:15	15:35	10:35
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
Alkalinity	--	--	--	--	--	--	--	--
Appearance/odor	mg/L	--	--	--	Silty	--	Cloudy/odor	--
DO	mg/L	--	0.79	--	0.79	--	0.78	--
Ferrous Iron	ft-bgs	--	1	--	1.5	--	1.5	--
Groundwater level	mg/L	13.75	--	13.25	--	12.55	--	13.54
Methane	ppm	2200	--	1250	--	35	--	880
ORP	mV	--	-125	--	-99	--	-123.9	--
pH	--	--	6.46	--	6.61	--	6.67	--
Specific Conductivity	µS/cm	--	1717	--	1696	--	1697	--
Temperature	°C	--	21.2	--	21.6	--	21.8	--
Turbidity	NTU	--	--	--	--	--	--	--
Field Notes	--	--	--	Second reading = 57 ppm	--	Open	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 2
INJECTION FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S160A
DATE		11/20/2020
TIME		10:52
PARAMETER	Result Unit	Result
Alkalinity	--	--
Appearance/odor	mg/L	Clear
DO	mg/L	1.31
Ferrous Iron	ft-bgs	1.5
Groundwater level	mg/L	--
Methane	ppm	--
ORP	mV	-92.1
pH	--	6.72
Specific Conductivity	µS/cm	1844
Temperature	°C	21.9
Turbidity	NTU	--
Field Notes	--	--

NOTES:
-- = an observation was not recorded
µS/cm = Microsiemens per centimeter
DO = Dissolved oxygen
Ferrous Iron = Ferrous Ironrrous Iron
Ft-bgs = Ferrous Ironet below ground surface
Mg/L = Milligrams per liter
mV =Millivolts
NTU = Nephelometric Turbidity unit
ORP = Oxidation Reduction Potential
Ppm = Parts per million

TABLE 3
INJECTION GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Analytical Method			SM 2320B				SM 5310C
Well ID	Sample Date	Sample Purpose	Bicarbonate Alkalinity	Carbonate Alkalinity	Hydroxide Alkalinity	Total Alkalinity	Total Organic Carbon
Result Unit			mg/L	mg/L	mg/L	mg/L	mg/L
S049A	11/16/2020	REG	450	ND 5.0	ND 5.0	450	2.8
S049A	11/18/2020	REG	450	ND 5.0	ND 5.0	450	2.2
S049A	11/20/2020	REG	450	ND 5.0	ND 5.0	450	2.1 ^
S137A	11/11/2020	REG	420	ND 5.0	ND 5.0	420	1.5
S137A	11/12/2020	REG	490	ND 5.0	ND 5.0	490	180 ^
S137A	11/13/2020	REG	490	ND 5.0	ND 5.0	490	250 ^
S137A	11/16/2020	REG	480	ND 5.0	ND 5.0	480	220
S137A	11/17/2020	REG	440	ND 5.0	ND 5.0	440	360
S137A	11/18/2020	REG	380	ND 5.0	ND 5.0	380	150
S137A	11/19/2020	REG	330	ND 5.0	ND 5.0	330	140
S137A	11/20/2020	REG	380	ND 5.0	ND 5.0	380	520
S138A	11/11/2020	REG	440	ND 5.0	ND 5.0	440	14
S138A	11/12/2020	REG	470	ND 5.0	ND 5.0	470	23 B,^
S138A	11/13/2020	REG	480	ND 5.0	ND 5.0	480	32
S138A	11/16/2020	REG	460	ND 5.0	ND 5.0	460	17
S138A	11/17/2020	REG	680	ND 5.0	ND 5.0	680	220
S138A	11/18/2020	REG	590	ND 5.0	ND 5.0	590	170
S138A	11/19/2020	REG	600	ND 5.0	ND 5.0	600	110 ^
S138A	11/20/2020	REG	580	ND 5.0	ND 5.0	580	490
S139A	11/11/2020	REG	620	ND 5.0	ND 5.0	620	13
S139A	11/12/2020	REG	670	ND 5.0	ND 5.0	670	32 ^
S139A	11/13/2020	REG	680	ND 5.0	ND 5.0	680	78 ^
S139A	11/16/2020	REG	620	ND 5.0	ND 5.0	620	190
S139A	11/17/2020	REG	610	ND 5.0	ND 5.0	610	140
S139A	11/18/2020	REG	630	ND 5.0	ND 5.0	630	77
S139A	11/19/2020	REG	630	ND 5.0	ND 5.0	630	66
S139A	11/20/2020	REG	650	ND 5.0	ND 5.0	650	61
S140A	11/10/2020	REG	400	ND 5.0	ND 5.0	400	2.3 ^
S140A	11/11/2020	REG	600	ND 5.0	ND 5.0	600	53
S140A	11/13/2020	REG	580	ND 5.0	ND 5.0	580	46
S140A	11/16/2020	REG	540	ND 5.0	ND 5.0	540	46
S140A	11/17/2020	REG	550	ND 5.0	ND 5.0	550	45
S140A	11/18/2020	REG	710	ND 5.0	ND 5.0	710	120
S140A	11/19/2020	REG	560	ND 5.0	ND 5.0	560	56
S140A	11/20/2020	REG	560	ND 5.0	ND 5.0	560	54
S141A	11/12/2020	REG	510	ND 5.0	ND 5.0	510	5.1 ^

TABLE 3
INJECTION GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Analytical Method			SM 2320B				SM 5310C
Well ID	Sample Date	Sample Purpose	Bicarbonate Alkalinity	Carbonate Alkalinity	Hydroxide Alkalinity	Total Alkalinity	Total Organic Carbon
Result Unit			mg/L	mg/L	mg/L	mg/L	mg/L
S141A	11/13/2020	REG	540	ND 5.0	ND 5.0	540	28
S141A	11/16/2020	REG	570	ND 5.0	ND 5.0	570	ND 40
S141A	11/17/2020	REG	600	ND 5.0	ND 5.0	600	ND 10
S141A	11/18/2020	REG	640	ND 5.0	ND 5.0	640	7.3
S141A	11/19/2020	REG	620	ND 5.0	ND 5.0	620	11 ^
S141A	11/20/2020	REG	610	ND 5.0	ND 5.0	610	19
S143A	11/10/2020	REG	410	ND 5.0	ND 5.0	410	2.9 ^
S143A	11/12/2020	REG	410	ND 5.0	ND 5.0	410	56
S143A	11/13/2020	REG	420	ND 5.0	ND 5.0	420	41 B, ^
S143A	11/16/2020	REG	340	ND 5.0	ND 5.0	340	ND 50
S143A	11/17/2020	REG	380	ND 5.0	ND 5.0	380	26
S143A	11/18/2020	REG	260	ND 5.0	ND 5.0	260	20
S143A	11/19/2020	REG	450	ND 5.0	ND 5.0	450	28
S143A	11/20/2020	REG	350	ND 5.0	ND 5.0	350	27
S145A	11/12/2020	REG	NS	NS	NS	NS	2.5 ^
S146A	11/11/2020	REG	450	ND 5.0	ND 5.0	450	35 ^
S146A	11/12/2020	REG	550	ND 5.0	ND 5.0	550	19 ^
S146A	11/13/2020	REG	510	ND 5.0	ND 5.0	510	24
S146A	11/16/2020	REG	450	ND 5.0	ND 5.0	450	160
S146A	11/17/2020	REG	470	ND 5.0	ND 5.0	470	37
S146A	11/18/2020	REG	480	ND 5.0	ND 5.0	480	ND 40
S146A	11/19/2020	REG	480	ND 5.0	ND 5.0	480	42 ^
S146A	11/20/2020	REG	430	ND 5.0	ND 5.0	430	170
S158A	11/11/2020	REG	410	ND 5.0	ND 5.0	410	3.3
S158A	11/12/2020	REG	410	ND 5.0	ND 5.0	410	5.8 ^
S158A	11/13/2020	REG	400	ND 5.0	ND 5.0	400	2.5
S158A	11/16/2020	REG	570	ND 5.0	ND 5.0	570	240
S158A	11/17/2020	REG	530	ND 5.0	ND 5.0	530	180
S158A	11/18/2020	REG	520	ND 5.0	ND 5.0	520	180
S158A	11/19/2020	REG	490	ND 5.0	ND 5.0	490	120 ^
S158A	11/20/2020	REG	580	ND 5.0	ND 5.0	580	170
S159A	11/11/2020	REG	440	ND 5.0	ND 5.0	440	4.6
S159A	11/12/2020	REG	430	ND 5.0	ND 5.0	430	4.6 ^
S159A	11/13/2020	REG	430	ND 5.0	ND 5.0	430	7.4 ^
S159A	11/16/2020	REG	430	ND 5.0	ND 5.0	430	2.9
S159A	11/17/2020	REG	440	ND 5.0	ND 5.0	440	6.2

TABLE 3
INJECTION GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Analytical Method			SM 2320B				SM 5310C
Well ID	Sample Date	Sample Purpose	Bicarbonate Alkalinity	Carbonate Alkalinity	Hydroxide Alkalinity	Total Alkalinity	Total Organic Carbon
Result Unit			mg/L	mg/L	mg/L	mg/L	mg/L
S159A	11/18/2020	REG	430	ND 5.0	ND 5.0	430	4.0
S159A	11/19/2020	REG	540	ND 5.0	ND 5.0	540	78
S159A	11/20/2020	REG	890	ND 5.0	ND 5.0	890	580
S160A	11/11/2020	REG	710	ND 5.0	ND 5.0	710	5.4
S160A	11/12/2020	REG	710	ND 5.0	ND 5.0	710	5.2 ^
S160A	11/13/2020	REG	680	ND 5.0	ND 5.0	680	4.2
S160A	11/16/2020	REG	640	ND 5.0	ND 5.0	640	21.0
S160A	11/17/2020	REG	650	ND 5.0	ND 5.0	650	57.0
S160A	11/18/2020	REG	660	ND 5.0	ND 5.0	660	6.8
S160A	11/19/2020	REG	680	ND 5.0	ND 5.0	680	4.7 ^
S160A	11/20/2020	REG	640	ND 5.0	ND 5.0	640	5.6

NOTES:

^ = Instrument related QC is outside acceptance limits

B = Compound was found in the blank and sample

mg/L = Milligrams per liter

ND 5.0 = An non-detect at the reporting of 5.0

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S025A	S025A	S025A	S025A	S049A	S049A	S049A
DATE		9/14/2020	12/15/2020	5/18/2021	11/9/2021	9/15/2020	12/16/2020	1/18/2021
TIME		12:21	11:03	7:30	10:43	8:19	7:39	12:28
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	0.2	0.36	2.65	0.64	0.2	0.44	0.32
Ferrous Iron	mg/L	0	0.5	0	0.5	0	0.5	1
Groundwater level	ft-bgs	12.41	12.78	20.1	12.74	10.21	10.1	10.17
Manganese	mg/L	--	0.77	0.26	0.77	--	0.77	--
Methane	ppm	0	230	0	0	0	160	1000
ORP	mV	116.4	-11.1	59.6	48	-42.1	-56	17.9
pH	--	6.76	6.63	6.76	6.79	6.88	6.6	6.71
Specific Conductivity	µS/cm	1646	1455	1328	1456	1416	1262	1618
Temperature	(°C)	21	21.3	20.1	21.6	20.2	18.9	20.6
Turbidity	NTU	8.6	85.72	1.45	3.6	11.4	3.62	7.36
Field Notes	--	--	--	--	--	--	--	Presence of bio material, brown orange in initial 1 gal of purge water.

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S049A	S049A	S049A	S049A	S088A	S088A	S088A
DATE		2/16/2021	5/18/2021	8/18/2021	11/9/2021	9/14/2020	12/15/2020	5/18/2021
TIME		7:46	9:30	8:55	9:35	9:15	10:00	8:29
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	1.35	2.58	0.63	0.81	0.3	0.51	2.79
Ferrous Iron	mg/L	0.5	1	1	1	0	0.5	0
Groundwater level	ft-bgs	9.73	10.95	10.45	10.22	13.39	12.4	13.17
Manganese	mg/L	--	0.77	0.77	0.77	--	0.66	0.42
Methane	ppm	8800	0	0	0	0	1050	0
ORP	mV	-290	-38.7	-52.9	-23.8	-77.6	-86	-41.9
pH	--	6.69	6.6	6.53	6.62	7.02	6.93	7.04
Specific Conductivity	µS/cm	1488	1507	1782	1704	1457	1266	1248
Temperature	(°C)	18.9	19.4	20.4	20.3	19.9	19.3	18.4
Turbidity	NTU	0.7	1.44	0.02	54.7	21.8	8.17	6.83
Field Notes	--	--	--	--	--	--	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S088A	S134A	S134A	S134A	S134A	S134A	S134A
DATE		11/9/2021	9/14/2020	12/15/2020	1/18/2021	2/15/2021	5/17/2021	8/17/2021
TIME		8:45	8:27	8:30	9:55	11:14	9:50	11:38
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	0.71	0.3	0.6	0.42	0.39	1.37	2.72
Ferrous Iron	mg/L	1.5	0	0	0	0	0	0
Groundwater level	ft-bgs	13.43	8.2	7.61	8.03	7.45	7.47	7.61
Manganese	mg/L	0.77	--	0.21	--	0.64	--	0.56
Methane	ppm	0	550	180	195	1100	175	0
ORP	mV	-97.3	9.9	-37.4	-75.4	23.3	26.2	-6.7
pH	--	7.14	7.02	7.05	7.05	6.94	7.01	7.03
Specific Conductivity	µS/cm	1267	1295	1266	1268	1170	1187	1145
Temperature	(°C)	19.2	23.4	23.5	21.1	21.1	20	20.5
Turbidity	NTU	3.5	3	3.5	37.05	33.27	97.3	4.56
Field Notes	--	--	--	--	--	--	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S134A	S137A	S137A	S137A	S137A	S137A	S137A
DATE		11/8/2021	9/15/2020	12/17/2020	1/18/2021	2/15/2021	5/17/2021	8/17/2021
TIME		12:07	11:30	7:50	11:19	9:03	8:30	7:39
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	0.67	0.3	0.57	0.32	1.33	2.69	0.7
Ferrous Iron	mg/L	0	0	2	4	2.5	4	4.5
Groundwater level	ft-bgs	8.08	12.5	12.19	12.26	11.8	11.98	12.32
Manganese	mg/L	0.35	--	0.77	--	--	0.77	0.77
Methane	ppm	130	0	530	50250	--	2200	9600
ORP	mV	-3.3	-8.6	-155.9	-189	-110.7	-141.1	-144.5
pH	--	6.95	6.91	6.94	6.7	6.56	6.73	6.68
Specific Conductivity	µS/cm	1314	1352	692	804	821	862	1491
Temperature	(°C)	24.5	22.7	20.2	22.4	21	21.1	22.6
Turbidity	NTU	2.44	8.4	300.03	134.26	324.7	3.48	5.17
Field Notes	--	--	--	--	High initial methane, meter max. 5,000 ppm after opened for 10 minutes.	Meter maximum	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S137A	S138A	S138A	S138A	S138A	S138A	S138A
DATE		11/8/2021	9/16/2020	12/18/2020	1/20/2021	2/17/2021	5/19/2021	8/19/2021
TIME		10:30	11:00	8:27	9:20	11:09	9:00	7:40
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	0.59	0.2	0.25	0.23	1.3	1.92	0.55
Ferrous Iron	mg/L	5.5	1.5	1	0	0.5	1	1
Groundwater level	ft-bgs	12.13	13.27	13.05	13.17	12.71	--	13.15
Manganese	mg/L	0.77	--	0.77	--	--	0.77	0.77
Methane	ppm	670	0	230	22250	4400	42250	34000
ORP	mV	-120.7	-144.6	-283.1	-306.6	-293.5	-281.7	-220.1
pH	--	6.77	7.11	6.25	6.7	6.72	6.61	6.55
Specific Conductivity	µS/cm	1600	1162	1023	1073	1041	960	1153
Temperature	(°C)	23.8	22.1	21.3	21	21.7	21.7	22.8
Turbidity	NTU	38.4	28.5	660.18	12.91	123.9	0.97	0.58
Field Notes	--	--	--	--	--	--	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S138A	S139A	S139A	S139A	S139A	S139A	S139A
DATE		11/10/2021	9/16/2020	12/17/2020	1/18/2021	2/16/2021	5/18/2021	8/18/2021
TIME		7:35	7:38	9:03	8:30	8:35	12:03	11:25
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	0.61	0.3	0.16	0.22	1.23	2.27	0.75
Ferrous Iron	mg/L	0.5	2	0.5	0	1	4.5	5.5
Groundwater level	ft-bgs	13.04	13.34	13.05	13.14	12.65	12.75	13.3
Manganese	mg/L	0.77	--	0.77	--	--	0.77	0.77
Methane	ppm	11250	0	2050	50250	--	720	9400
ORP	mV	-183.7	-45.7	-251.7	-306.2	-233.5	-128.5	-102.9
pH	--	6.77	6.6	6.54	6.68	6.65	6.59	6.57
Specific Conductivity	µS/cm	1079	1384	1407	1647	1722	1601	1890
Temperature	(°C)	23.4	22.3	21.8	21.6	21.3	22	24.7
Turbidity	NTU	1.3	3.4	379.77	161.2	105.1	1.3	3.46
Field Notes	--	--	--	--	High initial methane, meter max	Meter maximum	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S139A	S140A	S140A	S140A	S140A	S140A	S140A
DATE		11/10/2021	9/16/2020	12/18/2020	1/20/2021	2/17/2021	5/19/2021	8/19/2021
TIME		8:50	10:00	9:40	11:27	13:05	12:15	9:57
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	0.66	0.2	0.12	0.27	1.39	1.94	0.62
Ferrous Iron	mg/L	4	1	0.5	1	1.5	1.5	1
Groundwater level	ft-bgs	13.09	13.66	13.15	13.41	12.96	--	13.53
Manganese	mg/L	0.77	--	0.77	--	--	0.77	0.77
Methane	ppm	2000	195	4500	2900	1600	0	2550
ORP	mV	-103.8	-79.8	-310.2	-267.2	-124.9	-131.5	-207.9
pH	--	6.65	7.1	6.91	7.03	7	7.03	6.96
Specific Conductivity	µS/cm	1573	1307	1428	1385	1278	1197	1504
Temperature	(°C)	24.1	21.6	22	22.1	21.7	22	23.3
Turbidity	NTU	10.6	20.2	298.2	0.97	16.3	0.57	0
Field Notes	--	--	--	--	--	--	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S140A	S141A	S141A	S141A	S141A	S141A	S141A
DATE		11/10/2021	9/15/2020	12/16/2020	1/19/2021	2/16/2021	5/19/2021	8/18/2021
TIME		11:20	9:15	10:04	12:00	10:45	7:40	7:43
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	0.7	0.3	0.53	0.45	1.37	2.07	0.65
Ferrous Iron	mg/L	0.5	0	5	5.5	2.5	5	3.5
Groundwater level	ft-bgs	13.28	14.4	14.51	14.55	14.18	--	14.75
Manganese	mg/L	0.77	--	0.19	--	--	0.77	0.77
Methane	ppm	2800	0	320	15	165	0	0
ORP	mV	-193.4	108.9	-116	-123.1	-171	-108.5	-99.9
pH	--	7.09	6.8	6.38	6.46	6.47	6.22	6.42
Specific Conductivity	µS/cm	1446	1414	1842	2216	2106	2116	2067
Temperature	(°C)	23.6	21.4	22	21.8	21.4	20.6	21.5
Turbidity	NTU	1	2.7	59.84	22.35	15.5	0.71	1.03
Field Notes	--	--	--	--	--	--	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S141A	S143A	S143A	S143A	S143A	S143A	S143A
DATE		11/9/2021	9/15/2020	12/16/2020	1/19/2021	2/15/2021	5/17/2021	8/17/2021
TIME		12:30	7:10	8:53	10:45	8:13	7:30	10:21
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	0.65	0.7	0.25	0.33	1.32	2.7	0.72
Ferrous Iron	mg/L	2.5	0	3	5	4	4	3.5
Groundwater level	ft-bgs	14.38	13.03	12.99	12.96	12.56	12.56	12.98
Manganese	mg/L	0.77	--	0.77	--	--	0.77	0.77
Methane	ppm	240	0	105	1700	15000	0	2900
ORP	mV	-70.7	120.9	-182.1	-184.9	-145.6	-135.7	-118.1
pH	--	6.49	6.99	6.44	6.53	6.56	6.58	6.51
Specific Conductivity	µS/cm	1869	1290	1779	1743	1666	1357	1499
Temperature	(°C)	23.5	22	22.1	21.9	21	20.4	24.2
Turbidity	NTU	0.8	5.5	289.5	253.98	227.9	2.1	0.44
Field Notes	--	--	--	--	--	--	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S143A	S146A	S146A	S146A	S146A	S146A	S146A
DATE		11/8/2021	9/16/2020	12/17/2020	1/20/2021	2/16/2021	5/19/2021	8/19/2021
TIME		10:05	8:35	10:28	8:05	11:58	10:05	8:55
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	0.6	0.3	0.15	0.27	1.19	1.97	0.61
Ferrous Iron	mg/L	2	0.5	1	0.5	2.5	0.5	1.5
Groundwater level	ft-bgs	12.77	12.64	12.32	12.45	11.98	--	12.45
Manganese	mg/L	0.77	--	0.77	--	--	0.77	0.77
Methane	ppm	85	190	470	540	1250	0	115
ORP	mV	-97.1	-51.4	-308.9	-319.3	-299.4	-317.8	-160.4
pH	--	6.67	7.12	6.48	6.97	7.01	7.17	7.11
Specific Conductivity	µS/cm	1421	1080	920	1037	1002	953	1078
Temperature	(°C)	24	21.4	21	19.8	21.6	21.8	22.5
Turbidity	NTU	1.2	57.6	1323.2	68.21	19.3	1.97	5.4
Field Notes	--	--	--	--	--	--	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S146A	S158A	S158A	S158A	S158A	S158A	S158A
DATE		11/10/2021	9/14/2020	12/17/2020	1/20/2021	2/17/2021	5/18/2021	8/18/2021
TIME		10:27	10:51	11:53	10:28	12:12	11:09	12:29
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	0.69	0.3	0.15	0.27	1.38	2.01	0.69
Ferrous Iron	mg/L	1.5	0	3	4	5	7	5.5
Groundwater level	ft-bgs	12.3	12.82	12.41	12.56	12.1	12.11	12.6
Manganese	mg/L	0.77	--	0.77	--	--	0.77	0.77
Methane	ppm	0	0	400	15	0	0	13250
ORP	mV	-139.8	-46.7	-261.1	-220.6	-183.7	-146.5	-104
pH	--	7.2	6.89	6.31	6.5	6.54	6.47	6.26
Specific Conductivity	µS/cm	1041	1412	1612	2058	2020	2124	2689
Temperature	(°C)	22.9	22	21.9	21.9	21.3	21.3	24.3
Turbidity	NTU	1.5	89	1502.1	193.87	189.6	6.02	12.37
Field Notes	--	--	--	--	--	--	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S158A	S159A	S159A	S159A	S159A	S159A	S159A
DATE		11/9/2021	9/15/2020	12/15/2020	1/19/2021	2/15/2021	5/17/2021	8/17/2021
TIME		7:34	10:20	12:12	8:15	12:34	11:20	9:04
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	0.66	0.3	0.38	0.34	1.24	2.43	0.6
Ferrous Iron	mg/L	2	0	4.5	2.5	3	3.5	4
Groundwater level	ft-bgs	12.39	13.9	13.57	13.61	13.19	13.56	13.76
Manganese	mg/L	0.77	--	0.77	--	--	0.77	0.77
Methane	ppm	0	15	230	4300	--	50250	50250
ORP	mV	-114.9	-6.6	-142.1	-95.1	-67.8	-126.1	-113.1
pH	--	6.44	7.07	5.9	5.99	6.18	6.56	6.63
Specific Conductivity	µS/cm	2555	1514	2340	2408	2750	2467	2927
Temperature	(°C)	22.9	22.1	22.2	20.9	21.6	22	23.5
Turbidity	NTU	4.4	30.2	800	474.43	795.9	14.57	7.79
Field Notes	--	--	--	--	Turbidity would not stabilize.	Meter maximum	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S159A	S160A	S160A	S160A	S160A	S160A	S160A
DATE		11/8/2021	9/15/2020	12/16/2020	1/19/2021	2/16/2021	5/18/2021	8/18/2021
TIME		9:51	12:40	11:14	9:30	9:42	10:50	10:10
PARAMETER	Result Unit	Result	Result	Result	Result	Result	Result	Result
DO	mg/L	0.84	0.3	0.4	0.43	1.37	2.36	0.75
Ferrous Iron	mg/L	1	0	4	4	3	2.5	4
Groundwater level	ft-bgs	13.61	14.54	14.29	14.64	14.21	14.29	14.85
Manganese	mg/L	0.77	--	0.77	--	--	0.77	0.77
Methane	ppm	50250	120	600	0	870	0	0
ORP	mV	-103.9	52.7	-156.1	-137.2	-148.8	-130.8	-100.7
pH	--	6.78	6.82	6.55	6.57	6.54	6.49	6.47
Specific Conductivity	µS/cm	2499	1951	1602	1867	1884	1929	2102
Temperature	(°C)	21.2	22.3	21.4	21.5	20.9	21.4	23
Turbidity	NTU	10.2	11.2	12.94	-2.57	137	1.31	0
Field Notes	--	--	--	--	--	--	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 4
FIELD PARAMETERS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

WELL ID		S160A
DATE		11/9/2021
TIME		11:45
PARAMETER	Result Unit	Result
DO	mg/L	0.68
Ferrous Iron	mg/L	2.5
Groundwater level	ft-bgs	14.6
Manganese	mg/L	0.77
Methane	ppm	0
ORP	mV	-55.7
pH	--	6.55
Specific Conductivity	µS/cm	2013
Temperature	(°C)	23
Turbidity	NTU	2.5
Field Notes	--	--

NOTES:

-- = an observation was not recorded

µS/cm = Microsiemens per centimeter

DO = Dissolved oxygen

Ft-bgs = Ferrous Ironet below ground surface

Mg/L = Milligrams per liter

mV =Millivolts

NTU = Nephelometric Turbidity unit

ORP = Oxidation Reduction Potential

Ppm = Parts per million

TABLE 5
POST-INJECTION GROUNDWATER MONITORING SCHEDULE
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Well ID	EUROFINS TEST AMERICA						PACE ANALYTICAL				MICROBIAL INSIGHTS
	EPA 8260B VOCs	EPA 200.7 Dissolved Mn & As	EPA 300.0 Nitrate & Sulfate	SM 2320 Alkalinity	SM 4500-S2 Sulfide	SM 5310C TOC	AM20GAX Hydrogen	AM23G VFAs	RSK-175 CO_2	RSK-175 MEE	QuantArray-Chlor Microbial DNA
Month 1: 15-18 December 2020											
S025A	x		x		x	x				x	
S049A	x		x	x	x	x	x	x	x	x	
S088A	x		x		x	x				x	
S134A	x		x	x	x	x	x	x	x	x	
S137A	x		x	x	x	x	x	x	x	x	
S138A	x		x	x	x	x	x	x	x	x	
S139A	x		x	x	x	x	x	x	x	x	
S140A	x		x	x	x	x	x	x	x	x	
S141A	x		x	x	x	x	x	x	x	x	
S143A	x		x	x	x	x	x	x	x	x	
S146A	x		x	x	x	x	x	x	x	x	
S158A	x		x	x	x	x	x	x	x	x	
S159A	x		x	x	x	x	x	x	x	x	
S160A	x		x	x	x	x	x	x	x	x	
Month 2: 18-20 January 2021											
S049A	x	x	x	x	x	x	x	x	x	x	
S134A	x	x	x	x	x	x	x	x	x	x	
S137A	x	x	x	x	x	x	x	x	x	x	
S138A	x	x	x	x	x	x	x	x	x	x	
S139A	x	x	x	x	x	x	x	x	x	x	
S140A	x	x	x	x	x	x	x	x	x	x	
S141A	x	x	x	x	x	x	x	x	x	x	
S143A	x	x	x	x	x	x	x	x	x	x	
S146A	x	x	x	x	x	x	x	x	x	x	
S158A	x	x	x	x	x	x	x	x	x	x	
S159A	x	x	x	x	x	x	x	x	x	x	
S160A	x	x	x	x	x	x	x	x	x	x	
Quarter 1: 15-17 February 2021											
S049A	x	x	x	x	x	x	x	x	x	x	x
S134A	x	x	x	x	x	x	x	x	x	x	x
S137A	x	x	x	x	x	x	x	x	x	x	x
S138A	x	x	x	x	x	x	x	x	x	x	x

TABLE 5
POST-INJECTION GROUNDWATER MONITORING SCHEDULE
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Well ID	EUROFINS TEST AMERICA						PACE ANALYTICAL				MICROBIAL INSIGHTS
	EPA 8260B VOCs	EPA 200.7 Dissolved Mn & As	EPA 300.0 Nitrate & Sulfate	SM 2320 Alkalinity	SM 4500-S2 Sulfide	SM 5310C TOC	AM20GAX Hydrogen	AM23G VFAs	RSK-175 CO_2	RSK-175 MEE	QuantArray-Chlor Microbial DNA
S139A	x	x	x	x	x	x	x	x	x	x	x
S140A	x	x	x	x	x	x	x	x	x	x	x
S141A	x	x	x	x	x		x	x	x	x	x
S143A	x	x	x	x	x	x	x	x	x	x	x
S146A	x	x	x	x	x	x	x	x	x	x	x
S158A	x	x	x	x	x	x	x	x	x	x	x
S159A	x	x	x	x	x	x	x	x	x	x	x
S160A	x	x	x	x	x	x	x	x	x	x	x
Quarter 2: 17-19 May 2021											
S025A	x	x	x		x	x				x	
S049A	x	x	x	x	x	x	x	x	x	x	
S088A	x	x	x		x	x				x	
S134A	x	x	x	x	x	x	x	x	x	x	
S137A	x	x	x	x	x	x	x	x	x	x	
S138A	x	x	x	x	x	x	x	x	x	x	
S139A	x	x	x	x	x	x	x	x	x	x	
S140A	x	x	x	x	x	x	x	x	x	x	
S141A	x	x	x	x	x	x	x	x	x	x	
S143A	x	x	x	x	x	x	x	x	x	x	
S146A	x	x	x	x	x	x	x	x	x	x	
S158A	x	x	x	x	x	x	x	x	x	x	
S159A	x	x	x	x	x	x	x	x	x	x	
S160A	x	x	x	x	x	x	x	x	x	x	
Quarter 3: 17-19 August 2021											
S049A	x	x	x	x	x	x	x	x	x	x	x
S134A	x	x	x	x	x	x	x	x	x	x	x
S137A	x	x	x	x	x	x	x	x	x	x	x
S138A	x	x	x	x	x	x	x	x	x	x	x
S139A	x	x	x	x	x	x	x	x	x	x	x
S140A	x	x	x	x	x	x	x	x	x	x	x
S141A	x	x	x	x	x	x	x	x	x	x	x
S143A	x	x	x	x	x	x	x	x	x	x	x
S146A	x	x	x	x	x	x	x	x	x	x	x

TABLE 5
POST-INJECTION GROUNDWATER MONITORING SCHEDULE
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Well ID	EUROFINS TEST AMERICA						PACE ANALYTICAL				MICROBIAL INSIGHTS
	EPA 8260B VOCs	EPA 200.7 Dissolved Mn & As	EPA 300.0 Nitrate & Sulfate	SM 2320 Alkalinity	SM 4500-S2 Sulfide	SM 5310C TOC	AM20GAX Hydrogen	AM23G VFAs	RSK-175 CO_2	RSK-175 MEE	QuantArray-Chlor Microbial DNA
S158A	x	x	x	x	x	x	x	x	x	x	x
S159A	x	x	x	x	x	x	x	x	x	x	x
S160A	x	x	x	x	x	x	x	x	x	x	x
Quarter 4: 8-10 November 2021											
S025A	x	x	x		x	x				x	
S049A	x	x	x	x	x	x	x	x	x	x	x
S088A	x	x	x		x	x				x	
S134A	x	x	x	x	x	x	x	x	x	x	x
S137A	x	x	x	x	x	x	x	x	x	x	x
S138A	x	x	x	x	x	x	x	x	x	x	x
S139A	x	x	x	x	x	x	x	x	x	x	x
S140A	x	x	x	x	x	x	x	x	x	x	x
S141A	x	x	x	x	x	x	x	x	x	x	x
S143A	x	x	x	x	x	x	x	x	x	x	x
S146A	x	x	x	x	x	x	x	x	x	x	x
S158A	x	x	x	x	x	x	x	x	x	x	x
S159A	x	x	x	x	x	x	x	x	x	x	x
S160A	x	x	x	x	x	x	x	x	x	x	x

TABLE 6
GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID		S025A	S025A	S025A	S025A	S025A	S049A	S049A	S049A	S049A	S049A	S049A	S049A	S049A
Sample Date		9/14/20	12/15/20	5/18/21	5/18/21	11/8/21	9/15/20	12/16/20	1/18/21	2/16/21	5/18/21	5/18/21	8/18/21	11/9/21
Sample Purpose		REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG
Analysis Type		INIT	INIT	INIT	REANL	INIT	INIT	INIT	INIT	INIT	INIT	REANL	INIT	INIT
Parameter	Result Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 8260B - VOLATILE ORGANIC COMPOUNDS														
1,1,1,2-Tetrachloroethane	µg/L	ND 5	ND 5	ND 2	ND 0.5 H	ND 1 *+	ND 10	ND 5	ND 10	ND 2	ND 2	ND 1 H	ND 2	ND 1 *+
1,1,1-Trichloroethane (TCA)	µg/L	ND 5	ND 5	4.4 J	4.7 H	3.9 J	ND 10	ND 5	ND 10	ND 2	ND 3.4	ND 1.7 H	ND 3.4	2.6 J
1,1,2,2-Tetrachloroethane	µg/L	ND 5	ND 5	ND 2	ND 0.5 H	ND 1	ND 10	ND 5	ND 10	ND 2.2	ND 2	ND 1 H	ND 2	ND 1
1,1,2-Trichloroethane	µg/L	ND 5	ND 5	ND 2.2	ND 0.55 H	ND 1.1	ND 10	ND 5	ND 10	ND 2.4	ND 2.2	ND 1.1 H	ND 2.2	ND 1.1
1,1,2-Trichlorotrifluoroethane (CFC 113)	µg/L	ND 5	ND 5	ND 2.4	ND 0.6 H	ND 1.2	ND 10	ND 5	ND 10	ND 3.4	ND 2.4	ND 1.2 H	ND 2.4	ND 1.2
1,1-Dichloroethane (1,1-DCA)	µg/L	ND 5	ND 5	3.6 J	3.9 H	2.5 J	ND 10	ND 5	ND 10	4.3 J	6.9 J	4.7 J,H	3.2 J	2.6 J
1,1-Dichloroethene (1,1-DCE)	µg/L	ND 5	ND 5	ND 2.6	ND 0.65 H	ND 1.3	ND 10	ND 5	ND 10	ND 2.6	ND 2.6	1.6 J,H	ND 2.6	1.5 J
1,1-Dichloropropene	µg/L	ND 10	ND 5	ND 2.4	ND 0.6 H	ND 1.2	ND 10	ND 5	ND 10	ND 2.4	ND 2.4	ND 1.2 H	ND 2.4	ND 1.2
1,2,3-Trichlorobenzene	µg/L	ND 10	ND 10	ND 8	ND 2 H	ND 4	ND 20	ND 10	ND 20	ND 8	ND 8	ND 4 H	ND 8	ND 4
1,2,3-Trichloropropane	µg/L	ND 10	ND 10	ND 2.6	ND 0.65 H	ND 1.3	ND 20	ND 10	ND 20	ND 2.6	ND 2.6	ND 1.3 H	ND 2.6	ND 1.3
1,2,4-Trichlorobenzene	µg/L	ND 10	ND 10	ND 5	ND 1.3 H	ND 2.5	ND 20	ND 10	ND 20	ND 5	ND 5	ND 2.5 H	ND 5	ND 2.5
1,2,4-Trimethylbenzene	µg/L	ND 10	ND 10	ND 6.4	ND 1.6 H	ND 3.2	ND 20	ND 10	ND 20	ND 6.4	ND 6.4	ND 3.2 H	ND 6.4	ND 3.2
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	ND 5	ND 10	ND 4	ND 1 H	ND 2	ND 20	ND 10	ND 20	ND 4	ND 4	ND 2 H	ND 4	ND 2
1,2-Dibromoethane (EDB)	µg/L	ND 5	ND 5	ND 2.4	ND 0.6 H	ND 1.2	ND 10	ND 5	ND 10	ND 2.4	ND 2.4	ND 1.2 H	ND 2.4	ND 1.2
1,2-Dichlorobenzene	µg/L	ND 5	ND 5	ND 1.9	ND 0.49 H	ND 0.97	ND 10	ND 5	ND 10	ND 1.9	ND 1.9	ND 0.97 H	ND 1.9	ND 0.97
1,2-Dichloroethane	µg/L	ND 5	ND 5	ND 2.8	ND 0.7 H	ND 1.4	ND 10	ND 5	ND 10	ND 2.8	ND 2.8	ND 1.4 H	ND 2.8	ND 1.4
1,2-Dichloropropane	µg/L	ND 5	ND 5	ND 3	ND 0.75 H	ND 1.5	ND 10	ND 5	ND 10	ND 3	ND 3	ND 1.5 H	ND 3	ND 1.5
1,3,5-Trimethylbenzene	µg/L	ND 5	ND 5	ND 3.2	ND 0.8 H	ND 1.6	ND 10	ND 5	ND 10	ND 3.2	ND 3.2	ND 1.6 H	ND 3.2	ND 1.6
1,3-Dichlorobenzene	µg/L	ND 10	ND 5	ND 1.7	ND 0.43 H	ND 0.86	ND 10	ND 5	ND 10	ND 1.7	ND 1.7	ND 0.86 H	ND 1.7	ND 0.86
1,3-Dichloropropane	µg/L	ND 5	ND 10	ND 2	ND 0.5 H	ND 1	ND 20	ND 10	ND 20	ND 2	ND 2	ND 1 H	ND 2	ND 1
1,4-Dichlorobenzene	µg/L	ND 10	ND 5	ND 1.7	ND 0.42 H	ND 0.83	ND 10	ND 5	ND 10	ND 1.7	ND 1.7	ND 0.83 H	ND 1.7	ND 0.83
2,2-Dichloropropane	µg/L	ND 20	ND 10	ND 9.2	ND 2.3 H	ND 4.6	ND 20	ND 10	ND 20	ND 9.2	ND 9.2	ND 4.6 H	ND 9.2	ND 4.6
2-Butanone (MEK)	µg/L	ND 5	ND 20	ND 6.6	ND 1.7 H	ND 3.3	1000	ND 20	ND 40	ND 6.6	ND 6.6	ND 3.3 H	ND 6.6	ND 3.3
2-Chlorotoluene	µg/L	ND 20	ND 5	ND 2.2	ND 0.55 H	ND 1.1	ND 40	ND 5	ND 10	ND 2.2	ND 2.2	ND 1.1 H	ND 2.2	ND 1.1
2-Hexanone	µg/L	ND 5	ND 20	ND 3.4	ND 0.85 H	ND 1.7	ND 10	ND 20	ND 40	ND 3.4	ND 3.4	ND 1.7 H	ND 3.4	ND 1.7
4-Chlorotoluene	µg/L	ND 10	ND 5	ND 2	ND 0.5 H	ND 1	ND 40	ND 5	ND 10	ND 2	ND 2	ND 1 H	ND 2	ND 1
4-Isopropyltoluene	µg/L	ND 100	ND 10	ND 3	ND 0.75 H	ND 1.5	ND 10	ND 10	ND 20	ND 3	ND 3	ND 1.5 H	ND 3	ND 1.5
Acetone	µg/L	ND 5	ND 100	ND 76	ND 19 H	ND 38	ND 20	ND 100	ND 200	ND 76	ND 76	ND 38 H	ND 76	ND 38
Benzene	µg/L	ND 10	ND 5	ND 1.6	ND 0.4 H	ND 0.8	ND 200	ND 5	ND 10	ND 1.6	ND 1.6	ND 0.8 H	ND 1.6	ND 0.8
Bromobenzene	µg/L	ND 10	ND 10	ND 1.8	ND 0.46 H	ND 0.91	ND 10	ND 10	ND 20	ND 1.8	ND 1.8	ND 0.91 H	ND 1.8	ND 0.91
Bromochloromethane	µg/L	ND 5	ND 10	ND 3.6	ND 0.9 H	ND 1.8	ND 20	ND 10	ND 20	ND 3.6	ND 3.6	ND 1.8 H	ND 3.6	ND 1.8
Bromodichloromethane	µg/L	ND 10	ND 5	ND 2.8	ND 0.7 H	ND 1.4	ND 20	ND 5	ND 10	ND 2.8	ND 2.8	ND 1.4 H	ND 2.8	ND 1.4
Bromoform	µg/L	ND 10	ND 10	ND 3.8	ND 0.95 H	ND 1.9 *+	ND 10	ND 10	ND 20	ND 3.8 *+	ND 3.8	ND 1.9 H	ND 3.8	ND 1.9 *+
Bromomethane	µg/L	ND 20	ND 10	ND 4.2	ND 1.1 H	ND 2.1	ND 20	ND 10	ND 20	ND 4.2	ND 4.2	ND 2.1 H	ND 4.2	ND 2.1
Carbon Disulfide	µg/L	ND 5	ND 20	ND 7.2	ND 1.8 H	3.7 J,B	ND 20	ND 20	ND 40	ND 7.2	ND 7.2	ND 3.6 H	ND 7.2	ND 3.6
Carbon Tetrachloride	µg/L	ND 5	ND 5	ND 2.4	ND 0.6 H	ND 1.2 *+	ND 40	ND 5	ND 10	ND 2.4	ND 2.4	ND 1.2 H	ND 2.4	ND 1.2 *+
Chlorobenzene	µg/L	ND 10	ND 5	ND 1.4	ND 0.35 H	ND 0.7	ND 10	ND 5	ND 10	ND 1.4	ND 1.4	ND 0.7 H	ND 1.4	ND 0.7
Chloroethane	µg/L	ND 10	ND 10	ND 4.8	ND 1.2 H	ND 2.4	ND 10	ND 10	ND 20	ND 4.8	ND 4.8	ND 2.4 H	ND 4.8	ND 2.4
Chloroform	µg/L	ND 10	ND 10	ND 2.4	ND 0.6 H	ND 1.2	ND 20	ND 10	ND 20	ND 2.4	ND 2.4	ND 1.2 H	ND 2.4	ND 1.2
Chloromethane	µg/L	ND 5	ND 10	ND 5.2	ND 1.3 H	ND 2.6	ND 20	ND 10	ND 20	ND 5.2	ND 5.2	ND 2.6 H	ND 5.2	ND 2.6
cis-1,2-Dichloroethene	µg/L	ND 5	460	680	--	550	110	370	680	1000	1500	--	590	730
cis-1,3-Dichloropropene	µg/L	ND 5	ND 5	ND 3	ND 0.75 H	ND 1.5	ND 20	ND 5	ND 10	ND 3	ND 3	ND 1.5 H	ND 3	ND 1.5
Dibromochloromethane	µg/L	ND 10	ND 5	ND 3.2	ND 0.8 H	ND 1.6	ND 10	ND 5	ND 10	ND 3.2	ND 3.2	ND 1.6 H	ND 3.2	ND 1.6
Dibromomethane	µg/L	ND 5	ND 5	ND 3.4	ND 0.85 H	ND 1.7	ND 10	ND 5	ND 10	ND 3.4	ND 3.4	ND 1.7 H	ND 3.4	ND 1.7
Dichlorodifluoromethane (CFC 12)	µg/L	ND 5	ND 10	ND 6.4	2.3 J,H	ND 3.2	ND 10	ND 10	ND 20	ND 6.4	ND 6.4	ND 3.2 H	ND 6.4	ND 3.2
Ethylbenzene	µg/L	ND 20	ND 5	ND 1.7	ND 0.42 H	ND 0.84	ND 20	ND 5	ND 10	ND 1.7	ND 1.7	ND 0.84 H	ND 1.7	ND 0.84
Hexachlorobutadiene	µg/L	ND 10	ND 10	ND 4.6	ND 1.2 H	ND 2.3 *+	ND 10	ND 10	ND 20	ND 4.6 *+	ND 4.6	ND 2.3 H	ND 4.6	ND 2.3 *+
Isopropylbenzene	µg/L	ND 5	ND 5	ND 2.2	ND 0.55 H	ND 1.1	ND 20	ND 5	ND 10	ND 2.2	ND 2.2	ND 1.1 H	ND 2.2	ND 1.1
Methyl Isobutyl Ketone	µg/L	ND 10	ND 20	ND 2.2	ND 0.55 H	ND 1.1	ND 10	ND 20	ND 40	ND 2.2	ND 2.2	ND 1.1 H	ND 2.2	ND 1.1
Methylene Chloride	µg/L	ND 10	ND 10	ND 3.2	1.2 J,H,B	ND 1.6	ND 40	ND 10	ND 20	ND 3.2	4.3 J	3 J,H,B	ND 3.2	ND 1.6
MTBE	µg/L	ND 10	ND 5	ND 2.4	ND 0.6 H	ND 1.2	ND 20	ND 5	ND 10	ND 2.4	ND 2.4	ND 1.2 H	ND 2.4	ND 1.2
Naphthalene	µg/L	ND 10	ND 10	ND 9.6	ND 2.4 H	ND 4.8	ND 10	ND 10	ND 20	ND 9.6	ND 9.6	ND 4.8 H	ND 9.6	ND 4.8
n-Butylbenzene	µg/L	ND 5	ND 10	ND 3.6	ND 0.9 H	ND 1.8	63	ND 10	ND 20	ND 3.6	ND 3.6	ND 1.8 H	ND 3.6	ND 1.8
n-Propylbenzene	µg/L	ND 10	ND 10	ND 2.2	ND 0.55 H	ND 1.1	ND 20	ND 10	ND 20	ND 2.2	ND 2.2	ND 1.1 H	ND 2.2	ND 1.1
sec-Butylbenzene	µg/L	ND 5	ND 10	ND 2.8	ND 0.7 H	ND 1.4	ND 20	ND 10	ND 20	ND 2.8	ND 2.8	ND 1.4 H	ND 2.8	ND 1.4
Styrene	µg/L	ND 5	ND 5	ND 2.6	ND 0.65 H	ND 1.3	ND 20	ND 5	ND 10	ND 2.6	ND 2.6	ND 1.3 H	ND 2.6	ND 1.3
tert-Butylbenzene	µg/L	ND 5	ND 10	ND 2.6	ND 0.65 H	ND 1.3	ND 20	ND 10	ND 20	ND 2.6	ND 2.6	ND 1.3 H	ND 2.6	ND 1.3
Tetrachloroethene (PCE)	µg/L	ND 10	ND 5	ND 2	ND 0.5 H	ND 1	ND 10	ND 5	ND 10	ND 2	ND 2	ND 1 H	ND 2	ND 1
Toluene	µg/L	ND 20	ND 5	ND 1.9	ND 0.48 H	ND 0.95	ND 20	ND 5	ND 10	ND 1.9	ND 1.9	ND 0.95 H	ND 1.9	ND 0.95
trans-1,2-Dichloroethene	µg/L	ND 5	5	3.9 J	5.9 H	5.7	ND 10	ND 5	ND 10	3.5 J	10	7.1 H	5.5 J	6.5
trans-1,3-Dichloropropene	µg/L	ND 5	ND 5	ND 3.2	ND 0.8 H	ND 1.6	ND 10	ND 5	ND 10	ND 3.2	ND 3.2	ND 1.6 H	ND 3.2	ND 1.6
Trichloroethene (TCE)	µg/L	ND 5	60	36	38 H	26	ND 10	44	19	18	11	7 H	13	20
Trichlorofluoromethane (CFC 11)	µg/L	ND 5	ND 10	ND 2.6	ND 0.65 H	ND 1.3	ND 10	ND 10	ND 20	ND 2.6	ND 2.6	ND 1.3 H	ND 2.6	ND 1.3
Vinyl Acetate	µg/L	ND 5	ND 20	ND 3.8	ND 0.95 H	ND 1.9	ND 20	ND 20	ND 40	ND 3.8	ND 3.8	ND 1.9 H	ND 3.8	ND 1.9
Vinyl Chloride	µg/L	ND 5	190	21	21 H	300	ND 40	69	53	64	150	90 H	42	43
Xylenes, Total	µg/L	ND 5	ND 5	ND 5.4	ND 1.4 H	ND 2.7	ND 10	ND 5	ND 10	ND 5.4	ND 5.4	ND 2.7 H	ND 5.4	ND 2.7
SM 5310C - TOTAL ORGANIC CARBON														
Total Organic Carbon	mg/L	1.9	2.4	1.7	--	1.4	1.7	2.7	2.7	2	2.7	--	2.4	2.6
SM 4500S2-D - SULFIDE														
Sulfide	mg/L	ND 0.1	0.18	ND 0.022	--	ND 0.022	ND 0.1	ND 0.05 F1,F2	ND 0.05 ^1+	0.19	0.12 F1,F2	--	ND 0.022	0.026 J
SM 2320B - ALKALINITY														
Bicarbonate Alkalinity	mg/L	--	--	--	--	--	440	490	650	660	700	--	790	790
Carbonate Hydroxide	mg/L	--	--	--	--	--	ND 5	ND 5	ND 5	ND 5	ND 5	--	ND 5	ND 5
Hydroxide Alkalinity	mg/L	--	--	--	--	--	ND 5	ND 5	ND 5	ND 5	ND 5	--	ND 5	ND 5
Total Alkalinity	mg/L	--	--	--	--	--	440	490	650	660	700	--	790	790
EPA 300.0 - NITRATE AND SULFATE														
Nitrate	mg/L	ND 1.3	ND 1.3	ND 0.5	--	ND 0.5	ND 1.3	ND 1.3	ND 1.3	ND 0.88	ND 0.5	--	ND 0.5	ND 0.5
Sulfate	mg/L	240	220	210	--	180	200	180	150	150	130	--	76	59
EPA 200.7 - ARSENIC AND MANGANESE														
Arsenic	µg/L	--	--	ND 4.4	--	ND 19 H	--	--	ND 15	12 J	4.5 J	--	ND 4.4	ND 19 H
Manganese	µg/L	--	--	28	--	180 H	--	--	540	520	760	--	670 B	390 H
AM20GAX - HYDROGEN														
Hydrogen	nM	--	--	--	--	--	1.6 J	ND 0.49	2.1 J	ND 0.49	2.0	--	0.94 J	0.92 J
AM23G - VOLATILE FATTY ACIDS														
4-Methylpentanoic Acid	mg/L	--	--	--	--	--	ND 0.056	--	ND 0.056	ND 0.056	ND 0.056	--	ND 0.56	ND 0.56
Acetic Acid	mg/L	--	--	--	--	--	0.41 J	0.18 J	0.18 J	0.38 J	0.2 J	--	4.2 J	2.3 J
Butyric Acid	mg/L	--	--	--	--	--	ND 0.058	ND 0.058	ND 0.058	ND 0.058	ND 0.058	--	ND 0.58	ND 0.58
Formic Acid	mg/L	--	--	--	--	--	5.6	0.45 J	0.27 J	4.9	6.3	--	45	51
i-Hexanoic Acid	mg/L	--	--	--	--	--	0.098 J	ND 0.056	0.088 J	ND 0.058	ND 0.058	--	ND 0.58	ND 0.58
Isopentanoic Acid	mg/L	--	--	--	--	--	ND 0.061	ND 0.061	ND 0.061	ND 0.061	ND 0.061	--	ND 0.61	ND 0.61
Lactic Acid	mg/L	--	--	--	--	--	ND 0.053	ND 0.053	ND 0.053	ND 0.053	ND 0.053	--	ND 0.53	11
Pentanoic Acid	mg/L	--	--	--	--	--	ND 0.056	ND 0.056	ND 0.056	ND 0.056	ND 0.056	--	ND 0.56	ND 0.56
Propionic Acid	mg/L	--	--	--	--	--	0.053 J	ND 0.053	ND 0.053	ND 0.053	ND 0.053	--	ND 0.53	ND 0.53
Pyruvic Acid	mg/L	--	--	--	--	--	ND 0.06	ND 0.06	ND 0.06	ND 0.06	ND 0.06	--	ND 0.6	ND 0.6
RSK175 - DISSOLVED GASES														
Carbon Dioxide	mg/L	--	--	--	--	--	32.8	56.9	74.5	71.5	78.2	--	147	155
Ethane	mg/L	ND 0.000075	ND 0.000075	ND 0.00017	--	ND 0.00017	0.00072 J	ND 0.000075	0.00064 J	0.001	0.00079 J	--	0.00057 J	0.0011
Ethene	mg/L	0.00054 J	0.0015	ND 0.00024	--	0.0012	0.0023	0.00044 J	0.0013	0.0017	0.002	--	0.0049	0.0066
Methane	mg/L	0.016	0.02	0.007	--	0.022	0.45	0.11	0.23	0.34	1.3	--	1.6	2.2
QuantArray-Chlor - MICROBIAL														
APS	Cells/mL	--	--	--	--	--	19600	--	--	61500	--	--	32700	54600
BVC	Cells/mL	--	--	--	--	--	< 0.5	--	--	<0.5	--	--	<0.5	<0.5
CER	Cells/mL	--	--	--	--	--	762	--	--	355	--	--	71.4	30.4
CFR	Cells/mL	--	--	--	--	--	< 4.5	--	--	<4.6	--	--	<4.6	<4.7
DCA	Cells/mL	--	--	--	--	--	< 4.5	--	--	<4.6	--	--	<4.6	<4.7
DCAR	Cells/mL	--	--	--	--	--	< 4.5	--	--	<4.6	--	--	<4.6	<4.7
DCM	Cells/mL	--	--	--	--	--	< 4.5	--	--	51.5	--	--	29	<4.7
DCMA	Cells/mL	--	--	--	--	--	< 4.5	--	--	<4.6	--	--	<4.6	<4.7
DECO	Cells/mL	--	--	--	--	--	1160	--	--	1770	--	--	1810	2590
DHBt	Cells/mL	--	--	--	--	--	< 4.5	--	--	6590	--	--	12700	8490
DHC	Cells/mL	--	--	--	--	--	21.4	--	--	25.8	--	--	121	44.2
DHG	Cells/mL	--	--	--	--	--	33200	--	--	15300	--	--	4910	5660
DSB	Cells/mL	--	--	--	--	--	< 4.5	--	--	6680	--	--	8170	9620
DSM	Cells/mL	--	--	--	--	--	< 4.5	--	--	639	--	--	218	147
EBAC	Cells/mL	--	--	--	--	--	2190000	--	--	2060000	--	--	2170000	1290000
EtnC	Cells/mL	--	--	--	--	--	185	--	--	147	--	--	30	8
EtnE	Cells/mL	--	--	--	--	--	444	--	--	210	--	--	<4.6	36.7
MGN	Cells/mL	--	--	--	--	--	< 4.5	--	--	1610	--	--	16200	1030
PCE-1	Cells/mL	--	--	--	--	--	< 4.5	--	--	<4.6	--	--	<4.6	<4.7
PCE-2	Cells/mL	--	--	--	--	--	150	--	--	307	--	--	74.1	91.9
PHE	Cells/mL	--	--	--	--	--	292	--	--	1730	--	--	210	3170
RDEG	Cells/mL	--	--	--	--	--	440	--	--	2480	--	--	<4.6	3280
RMO	Cells/mL	--	--	--	--	--	59.8	--	--	1980	--	--	<4.6	289
SMMO	Cells/mL	--	--	--	--	--	< 4.5	--	--	<4.6	--	--	176	<4.7
TCBO	Cells/mL	--	--	--	--	--	< 4.5	--	--	<4.6	--	--	<4.6	<4.7
TCE	Cells/mL	--	--	--	--	--	< 0.5	--	--	<0.5	--	--	6.5	0.5 J
TDR	Cells/mL	--	--	--	--	--	< 4.5	--	--	<4.6	--	--	<4.6	<4.7
TOD	Cells/mL	--	--	--	--	--	< 4.5	--	--	<4.6	--	--	<4.6	26.2
VCR	Cells/mL	--	--	--	--	--	< 0.5	--	--	<0.5	--	--	4.3	0.3 J

For definitions and abbreviations please refer to the notes on page 12.

ED_013761_00000157-00150

TABLE 6
GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID		S088A	S088A	S088A	S088A	S088A	S134A	S134A	S134A	S134A	S134A	S134A	S134A	S137A
Sample Date		9/14/20	12/15/20	5/18/21	5/18/21	11/9/21	9/14/20	12/15/20	1/18/21	2/15/21	5/17/21	8/17/21	11/8/21	9/15/20
Sample Purpose		REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG
Analysis Type		INIT	INIT	INIT	REANL	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT
Parameter	Result Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 8260B - VOLATILE ORGANIC COMPOUNDS														
1,1,1,2-Tetrachloroethane	µg/L	ND 5	ND 10	ND 2	ND 0.5 H	ND 1 *+	ND 2	ND 0.5	ND 2.5	ND 0.4	ND 0.4	ND 0.4	ND 0.4	ND 5
1,1,1-Trichloroethane (TCA)	µg/L	ND 5	ND 10	ND 3.4	ND 0.85 H	4.4 J	ND 2	ND 0.5	ND 2.5	ND 0.4	ND 0.68	ND 0.68	ND 0.68	ND 5
1,1,2,2-Tetrachloroethane	µg/L	ND 5	ND 10	ND 2	ND 0.5 H	ND 1	ND 2	ND 0.5	ND 2.5	ND 0.44	ND 0.4	ND 0.4	ND 0.4	ND 5
1,1,2-Trichloroethane	µg/L	ND 5	ND 10	ND 2.2	ND 0.55 H	ND 1.1	ND 2	ND 0.5	ND 2.5	ND 0.48	ND 0.44	ND 0.44	ND 0.44	ND 5
1,1,2-Trichlorotrifluoroethane (CFC 113)	µg/L	ND 5	ND 10	ND 2.4	ND 0.6 H	ND 1.2	ND 2	ND 0.5	ND 2.5	1.1 J	ND 0.48	ND 0.48	ND 0.48	ND 5
1,1-Dichloroethane (1,1-DCA)	µg/L	ND 5	ND 10	ND 2	1.4 J,H	1.3 J	9.5	13	11	9.6	8.2	9.1	12	ND 5
1,1-Dichloroethene (1,1-DCE)	µg/L	ND 5	ND 10	ND 2.6	2.1 J,H	2.6 J	5.3	6.3	5	4.3	3.6	4.5	5.6	ND 5
1,1-Dichloropropene	µg/L	ND 5	ND 10	ND 2.4	ND 0.6 H	ND 1.2	ND 2	ND 0.5	ND 2.5	ND 0.48	ND 0.48	ND 0.48	ND 0.48	ND 5
1,2,3-Trichlorobenzene	µg/L	ND 10	ND 20	ND 8	ND 2 H	ND 4	ND 4	ND 1	ND 5	ND 1.6	ND 1.6	ND 1.6	ND 1.6	ND 10
1,2,3-Trichloropropane	µg/L	ND 10	ND 20	ND 2.6	ND 0.65 H	ND 1.3	ND 4	ND 1	ND 5	ND 0.52	ND 0.52	ND 0.52	ND 0.52	ND 10
1,2,4-Trichlorobenzene	µg/L	ND 10	ND 20	ND 5	ND 1.3 H	ND 2.5	ND 4	ND 1	ND 5	ND 1	ND 1	ND 1	ND 1 *+	ND 10
1,2,4-Trimethylbenzene	µg/L	ND 10	ND 20	ND 6.4	ND 1.6 H	ND 3.2	ND 4	ND 1	ND 5	ND 1.3	ND 1.3	ND 1.3	ND 1.3	ND 10
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	ND 10	ND 20	ND 4	ND 1 H	ND 2	ND 4	ND 1	ND 5	ND 0.8	ND 0.8	ND 0.8	ND 0.8	ND 10
1,2-Dibromoethane (EDB)	µg/L	ND 5	ND 10	ND 2.4	ND 0.6 H	ND 1.2	ND 2	ND 0.5	ND 2.5	ND 0.48	ND 0.48	ND 0.48	ND 0.48	ND 5
1,2-Dichlorobenzene	µg/L	ND 5	ND 10	ND 1.9	ND 0.49 H	ND 0.97	19	17	14	9.2	12	13	20	ND 5
1,2-Dichloroethane	µg/L	ND 5	ND 10	ND 2.8	ND 0.7 H	ND 1.4	ND 2	ND 0.5	ND 2.5	ND 0.56	ND 0.56	ND 0.56	ND 0.56	ND 5
1,2-Dichloropropane	µg/L	ND 5	ND 10	ND 3	ND 0.75 H	ND 1.5	ND 2	ND 0.5	ND 2.5	ND 0.6	ND 0.6	ND 0.6	ND 0.6	ND 5
1,3,5-Trimethylbenzene	µg/L	ND 5	ND 10	ND 3.2	ND 0.8 H	ND 1.6	ND 2	ND 0.5	ND 2.5	ND 0.64	ND 0.64	ND 0.64	ND 0.64	ND 5
1,3-Dichlorobenzene	µg/L	ND 5	ND 10	ND 1.7	ND 0.43 H	ND 0.86	ND 2	ND 0.5	ND 2.5	ND 0.34	ND 0.34	ND 0.34	ND 0.34	ND 5
1,3-Dichloropropane	µg/L	ND 10	ND 20	ND 2	ND 0.5 H	ND 1	ND 4	ND 1	ND 5	ND 0.4	ND 0.4	ND 0.4	ND 0.4	ND 10
1,4-Dichlorobenzene	µg/L	ND 5	ND 10	ND 1.7	ND 0.42 H	ND 0.83	ND 2	ND 0.5	ND 2.5	ND 0.33	ND 0.33	ND 0.33	ND 0.33	ND 5
2,2-Dichloropropane	µg/L	ND 10	ND 20	ND 9.2	ND 2.3 H	ND 4.6	ND 4	ND 1	ND 5	ND 1.8	ND 1.8	ND 1.8	ND 1.8	ND 10
2-Butanone (MEK)	µg/L	ND 20	ND 40	ND 6.6	ND 1.7 H	ND 3.3	ND 8	ND 2	ND 10	ND 1.3	ND 1.3	ND 1.3	ND 1.3	ND 20
2-Chlorotoluene	µg/L	ND 5	ND 10	ND 2.2	ND 0.55 H	ND 1.1	ND 2	ND 0.5	ND 2.5	ND 0.44	ND 0.44	ND 0.44	ND 0.44	ND 5
2-Hexanone	µg/L	ND 20	ND 40	ND 3.4	ND 0.85 H	ND 1.7	ND 8	ND 2	ND 10	ND 0.68	ND 0.68	ND 0.68	ND 0.68	ND 20
4-Chlorotoluene	µg/L	ND 5	ND 10	ND 2	ND 0.5 H	ND 1	ND 2	ND 0.5	ND 2.5	ND 0.4	ND 0.4	ND 0.4	ND 0.4	ND 5
4-Isopropyltoluene	µg/L	ND 10	ND 20	ND 3	ND 0.75 H	ND 1.5	ND 4	ND 1	ND 5	ND 0.6	ND 0.6	ND 0.6	ND 0.6	ND 10
Acetone	µg/L	ND 100	ND 200	ND 76	ND 19 H	ND 38	ND 40	ND 10	ND 50	ND 15	ND 15	ND 15	ND 15	ND 100
Benzene	µg/L	ND 5	ND 10	ND 1.6	ND 0.4 H	ND 0.8	ND 2	ND 0.5	ND 2.5	ND 0.32	ND 0.32	ND 0.32	ND 0.32	ND 5
Bromobenzene	µg/L	ND 10	ND 20	ND 1.8	ND 0.46 H	ND 0.91	ND 4	ND 1	ND 5	ND 0.36	ND 0.36	ND 0.36	ND 0.36	ND 10
Bromochloromethane	µg/L	ND 10	ND 20	ND 3.6	ND 0.9 H	ND 1.8	ND 4	ND 1	ND 5	ND 0.72	ND 0.72	ND 0.72	ND 0.72	ND 10
Bromodichloromethane	µg/L	ND 5	ND 10	ND 2.8	ND 0.7 H	ND 1.4	ND 2	ND 0.5	ND 2.5	ND 0.56	ND 0.56	ND 0.56	ND 0.56	ND 5
Bromoform	µg/L	ND 10	ND 20	ND 3.8	ND 0.95 H	ND 1.9 *+	ND 4	ND 1	ND 5	ND 0.76	ND 0.76	ND 0.76	ND 0.76	ND 10
Bromomethane	µg/L	ND 10	ND 20	ND 4.2	ND 1.1 H	ND 2.1	ND 4	ND 1	ND 5	ND 0.84	ND 0.84	ND 0.84	ND 0.84	ND 10
Carbon Disulfide	µg/L	ND 20	ND 40	ND 7.2	ND 1.8 H	ND 3.6	ND 8	ND 2	ND 10	ND 1.4	ND 1.4	ND 1.4	ND 1.4	ND 20
Carbon Tetrachloride	µg/L	ND 5	ND 10	ND 2.4	ND 0.6 H	ND 1.2 *+	ND 2	ND 0.5	ND 2.5	ND 0.48	ND 0.48	ND 0.48	ND 0.48	ND 5
Chlorobenzene	µg/L	ND 5	ND 10	ND 1.4	ND 0.35 H	ND 0.7	ND 2	ND 0.5	ND 2.5	ND 0.28	ND 0.28	ND 0.28	ND 0.28	ND 5
Chloroethane	µg/L	ND 10	ND 20	ND 4.8	ND 1.2 H	ND 2.4	ND 4	ND 1	ND 5	ND 0.96	ND 0.96	ND 0.96	ND 0.96	ND 10
Chloroform	µg/L	ND 10	ND 20	ND 2.4	ND 0.6 H	ND 1.2	ND 4	ND 1	ND 5	ND 0.48	ND 0.48	ND 0.48	ND 0.48	ND 10
Chloromethane	µg/L	ND 10	ND 20	ND 5.2	ND 1.3 H	ND 2.6	ND 4	ND 1	ND 5	ND 1	ND 1	ND 1	ND 1	ND 10
cis-1,2-Dichloroethene	µg/L	590	690	570	--	E 820 E	190	200	200	180	170	170	230	380
cis-1,3-Dichloropropene	µg/L	ND 5	ND 10	ND 3	ND 0.75 H	750	ND 2	ND 0.5	ND 2.5	ND 0.6	ND 0.6	ND 0.6	ND 0.6	ND 5
Dibromochloromethane	µg/L	ND 5	ND 10	ND 3.2	ND 0.8 H	ND 1.5	ND 2	ND 0.5	ND 2.5	ND 0.64	ND 0.64	ND 0.64	ND 0.64	ND 5
Dibromomethane	µg/L	ND 5	ND 10	ND 3.4	ND 0.85 H	ND 1.6	ND 2	ND 0.5	ND 2.5	ND 0.68	ND 0.68	ND 0.68	ND 0.68	ND 5
Dichlorodifluoromethane (CFC 12)	µg/L	ND 10	ND 20	ND 6.4	ND 1.6 H	ND 1.7	ND 4	ND 1	ND 5	ND 1.3	ND 1.3	ND 1.3	ND 1.3	ND 10
Ethylbenzene	µg/L	ND 5	ND 10	ND 1.7	ND 0.42 H	ND 3.2	ND 2	ND 0.5	ND 2.5	ND 0.34	ND 0.34	ND 0.34	ND 0.34	ND 5
Hexachlorobutadiene	µg/L	ND 10 ,*	ND 20	ND 4.6	ND 1.2 H	ND 0.84	ND 4 ,*	ND 1	ND 5	ND 0.92	ND 0.92	ND 0.92	ND 0.92 *+	ND 10
Isopropylbenzene	µg/L	ND 5	ND 10	ND 2.2	ND 0.55 H	ND 2.3 *+	ND 2	ND 0.5	ND 2.5	ND 0.44	ND 0.44	ND 0.44	ND 0.44	ND 5
Methyl Isobutyl Ketone	µg/L	ND 20	ND 40	ND 2.2	ND 0.55 H	ND 1.1	ND 8	ND 2	ND 10	ND 0.44	ND 0.44	ND 0.44	ND 0.44	ND 20
Methylene Chloride	µg/L	ND 10	ND 20	ND 3.2	1.3 J,H,B	ND 1.1	ND 4	ND 1	ND 5	ND 0.64	ND 0.64	ND 0.64	ND 0.64	ND 10
MTBE	µg/L	ND 5	ND 10	ND 2.4	ND 0.6 H	ND 1.6	ND 2	ND 0.5	ND 2.5	ND 0.48	ND 0.48	ND 0.48	ND 0.48	ND 5
Naphthalene	µg/L	ND 10	ND 20	ND 9.6	ND 2.4 H	ND 1.2	ND 4	ND 1	ND 5	ND 1.9	ND 1.9	ND 1.9	ND 1.9	ND 10
n-Butylbenzene	µg/L	ND 10	ND 20	ND 3.6	ND 0.9 H	ND 4.8	ND 4	ND 1	ND 5	ND 0.72	ND 0.72	ND 0.72	ND 0.72	ND 10
n-Propylbenzene	µg/L	ND 10	ND 20	ND 2.2	ND 0.55 H	ND 1.8	ND 4	ND 1	ND 5	ND 0.44	ND 0.44	ND 0.44	ND 0.44	ND 10
sec-Butylbenzene	µg/L	ND 10	ND 20	ND 2.8	ND 0.7 H	ND 1.1	ND 4	ND 1	ND 5	ND 0.56	ND 0.56	ND 0.56	ND 0.56	ND 10
Styrene	µg/L	ND 5	ND 10	ND 2.6	ND 0.65 H	ND 1.4	ND 2	ND 0.5	ND 2.5	ND 0.52	ND 0.52	ND 0.52	ND 0.52	ND 5
tert-Butylbenzene	µg/L	ND 10	ND 20	ND 2.6	ND 0.65 H	ND 1.3	ND 4	ND 1	ND 5	ND 0.52	ND 0.52	ND 0.52	ND 0.52	ND 10
Tetrachloroethene (PCE)	µg/L	ND 5	ND 10	ND 2	ND 0.5 H	ND 1.3	ND 2	ND 0.5	ND 2.5	1.2 J	1.1 J	ND 0.4	ND 0.4	ND 5
Toluene	µg/L	ND 5	ND 10	ND 1.9	ND 0.48 H	ND 1	ND 2	ND 0.5	ND 2.5	ND 0.38	ND 0.38	ND 0.38	ND 0.38	ND 5
trans-1,2-Dichloroethene	µg/L	ND 5	ND 10	4.3 J	4.3 H	ND 0.95	ND 2	1.2	ND 2.5	ND 0.44	1.1 J	1.6 J	1.4 J	ND 5
trans-1,3-Dichloropropene	µg/L	ND 5	ND 10	ND 3.2	ND 0.8 H	4.9 J	ND 2	ND 0.5	ND 2.5	ND 0.64	ND 0.64	ND 0.64	ND 0.64	ND 5
Trichloroethene (TCE)	µg/L	27	ND 10	ND 2	2 J,H	ND 1.6	28	8.4	3.2	27	15	2.7	3.5	17
Trichlorofluoromethane (CFC 11)	µg/L	ND 10	ND 20	ND 2.6	ND 0.65 H	2.5 J	ND 4	ND 1	ND 5	ND 0.52	ND 0.52	ND 0.52	ND 0.52	ND 10
Vinyl Acetate	µg/L	ND 20	ND 40	ND 3.8	ND 0.95 H	ND 1.3	ND 8	ND 2	ND 10	ND 0.76	ND 0.76	ND 0.76	ND 0.76 *+	ND 20
Vinyl Chloride	µg/L	27	26	18	19 H	ND 1.9	7.4	10	7.5	3.9	8.2	9.2	11	38
Xylenes, Total	µg/L	ND 5	ND 10	ND 5.4	ND 1.4 H	36	ND 2	ND 0.5	ND 2.5	ND 1.1	ND 1.1	ND 1.1	ND 1.1	ND 5
SM 5310C - TOTAL ORGANIC CARBON														
Total Organic Carbon	mg/L	1.6	1.7	1.7	--	1.3	1.9	1.8	1.9	1.8	1.8	1.3	1.3	1.5
SM 4500S2 -D - SULFIDE														
Sulfide	mg/L	ND 0.1	0.11	ND 0.022	--	ND 0.022	ND 0.1	ND 0.05	ND 0.05 ^1+	0.2 F1	0.27	ND 0.022 F1	ND 0.022	ND 0.1
SM 2320B - ALKALINITY														
Bicarbonate Alkalinity	mg/L	--	--	--	--	--	450	460	460	450	440	440	440	420
Carbonate Hydroxide	mg/L	--	--	--	--	--	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5
Hydroxide Alkalinity	mg/L	--	--	--	--	--	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5
Total Alkalinity	mg/L	--	--	--	--	--	450	460	460	450	440	440	440	420
EPA 300.0 - NITRATE AND SULFATE														
Nitrate	mg/L	ND 1.3	ND 1.3	ND 0.5	--	ND 0.5	ND 1.3	ND 1.3	ND 1.3	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 1.3
Sulfate	mg/L	180	180	180	--	180	130	130	130	140	140	130	130	180
EPA 200.7 - ARSENIC AND MANGANESE														
Arsenic	µg/L	--	--	ND 4.4	--	ND 19 H	--	--	ND 15	7.2 J	10 J	11 J	ND 19 H	--
Manganese	µg/L	--	--	370	--	230 H	--	--	450	340	430	410	410 H	--
AM20GAX - HYDROGEN														
Hydrogen	nM	--	--	--	--	--	1.0 J	ND 0.49	2.1	ND 0.49	4.0	1.0 J	0.82 J	1.6 J
AM23G - VOLATILE FATTY ACIDS														
4-Methylpentanoic Acid	mg/L	--	--	--	--	--	ND 0.056	--	ND 0.056	ND 0.056	ND 0.056	ND 0.56	ND 0.56	ND 0.056
Acetic Acid	mg/L	--	--	--	--	--	0.3 J	ND 0.12	0.12 J	0.27 J	0.18 J	3.9 J	2.4 J	0.31 J
Butyric Acid	mg/L	--	--	--	--	--	ND 0.058	ND 0.058	ND 0.058	ND 0.058	ND 0.058	ND 0.58	ND 0.58	ND 0.058
Formic Acid	mg/L	--	--	--	--	--	4.9	0.42 J	0.26 J	4.7	6.6	43	48	4.8
i-Hexanoic Acid	mg/L	--	--	--	--	--	0.075 J	ND 0.056	ND 0.058	ND 0.058	ND 0.058	ND 0.58	0.7 J	0.077 J
Isopentanoic Acid	mg/L	--	--	--	--	--	ND 0.061	ND 0.061	ND 0.061	ND 0.061	ND 0.061	ND 0.61	ND 0.61	ND 0.061
Lactic Acid	mg/L	--	--	--	--	--	ND 0.053	0.088 J	0.067 J	ND 0.053	ND 0.053	ND 0.53	ND 0.53	ND 0.053
Pentanoic Acid	mg/L	--	--	--	--	--	ND 0.056	ND 0.056	ND 0.056	ND 0.056	ND 0.056	ND 0.56	ND 0.56	ND 0.056
Propionic Acid	mg/L	--	--	--	--	--	ND 0.053	ND 0.053	ND 0.053	ND 0.053	ND 0.053	ND 0.53	ND 0.53	ND 0.053
Pyruvic Acid	mg/L	--	--	--	--	--	ND 0.06	ND 0.06	ND 0.06	ND 0.06	ND 0.06	ND 0.6	ND 0.6	ND 0.06
RSK175 - DISSOLVED GASES														
Carbon Dioxide	mg/L	--	--	--	--	--	24.8	29.9	29.5	29.5	24	45.3	32.7	31.2
Ethane	mg/L	0.041	ND 0.000075	ND 0.00017	--	0.00026 J	ND 0.000075	ND 0.000075	ND 0.000075	ND 0.000075	ND 0.00017	ND 0.00017	ND 0.00017	0.00027 J
Ethene	mg/L	ND 0.000075	ND 0.00012	ND 0.00024	--	0.0088	0.00051 J	0.00032 J	0.0012	ND 0.00012	0.00049 J	0.00064 J	0.00054 J	0.0011
Methane	mg/L	ND 0.00012	0.024	0.013	--	0.018	0.031	0.02	0.022	0.019	0.028	0.028	0.033	1.5
QuantArray-Chlor - MICROBIAL														
APS	Cells/mL	--	--	--	--	--	603	--	--	11700	--	4620	4410	18000
BVC	Cells/mL	--	--	--	--	--	< 0.5	--	--	<0.5	--	<0.5	<0.5	< 0.5
CER	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	<5.5	<4.7	279
CFR	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	<5.5	<4.7	< 4.5
DCA	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	<5.5	<4.7	< 4.5
DCAR	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	<5.5	<4.7	< 4.5
DCM	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	<5.5	<4.7	< 4.5
DCMA	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	<5.5	<4.7	< 4.5
DECO	Cells/mL	--	--	--	--	--	798	--	--	2390	--	1240	1070	815
DHBt	Cells/mL	--	--	--	--	--	< 4.6	--	--	355	--	<5.5	<4.7	2650
DHC	Cells/mL	--	--	--	--	--	28	--	--	46	--	97.8	48.6	621
DHG	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	3160	<4.7	12000
DSB	Cells/mL	--	--	--	--	--	< 4.6	--	--	570	--	192	<4.7	3700
DSM	Cells/mL	--	--	--	--	--	29.9	--	--	43.7	--	405	<4.7	< 4.5
EBAC	Cells/mL	--	--	--	--	--	114000	--	--	357000	--	452000	176000	1300000
EtnC	Cells/mL	--	--	--	--	--	57.4	--	--	441	--	106	<4.7	< 4.5
EtnE	Cells/mL	--	--	--	--	--	38.8	--	--	354	--	425	33.5	2.5 J
MGN	Cells/mL	--	--	--	--	--	< 4.6	--	--	8.6	--	3.4 J	9	< 4.5
PCE-1	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	<5.5	<4.7	< 4.5
PCE-2	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	<5.5	<4.7	30.6
PHE	Cells/mL	--	--	--	--	--	25.4	--	--	76.6	--	149	31.6	20.7
RDEG	Cells/mL	--	--	--	--	--	< 4.6	--	--	351	--	596	167	< 4.5
RMO	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	<5.5	<4.7	< 4.5
SMMO	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	<5.5	<4.7	< 4.5
TCBO	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	<5.5	<4.7	< 4.5
TCE	Cells/mL	--	--	--	--	--	< 0.5	--	--	1.8	--	0.2 J	0.3 J	136
TDR	Cells/mL	--	--	--	--	--	< 4.6	--	--	<4.6	--	<5.5	<4.7	< 4.5
TOD	Cells/mL	--	--	--	--	--	0.9 J	--	--	<4.6	--	<5.5	<4.7	< 4.5
VCR	Cells/mL	--	--	--	--	--	< 0.5	--	--	1.4	--	0.3 J	0.4 J	112

For definitions and abbreviations please refer to the notes on page 12.

ED_013761_00000157-00151

TABLE 6
GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID		S137A	S137A	S137A	S137A	S137A	S137A	S137A	S137A	S138A	S138A	S138A	S138A	S138A
Sample Date		9/15/20	12/17/21	12/17/21	1/18/21	2/15/21	5/17/21	8/17/21	11/8/21	9/16/20	12/18/20	1/20/20	2/17/21	2/17/21
Sample Purpose		FD	REG	FD	REG	REG	REG	REG	REG	REG	REG	REG	REG	FD
Analysis Type		INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT
Parameter	Result Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 8260B - VOLATILE ORGANIC COMPOUNDS														
1,1,1,2-Tetrachloroethane	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.1	ND 0.1	ND 0.2	ND 0.2	ND 250	ND 250	ND 250	ND 25	ND 25
1,1,1-Trichloroethane (TCA)	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.1	ND 0.17	ND 0.34	ND 0.34	ND 250	ND 250	ND 250	ND 25	ND 25
1,1,2,2-Tetrachloroethane	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.11	ND 0.1	ND 0.2	ND 0.2	ND 250	ND 250	ND 250	ND 28	ND 28
1,1,2-Trichloroethane	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.12	ND 0.11	ND 0.22	ND 0.22	ND 250	ND 250	ND 250	ND 30	ND 30
1,1,2-Trichlorotrifluoroethane (CFC 113)	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.17	ND 0.12	ND 0.24	ND 0.24	2000	3600	1700	760	770
1,1-Dichloroethane (1,1-DCA)	µg/L	ND 5	4.3	4.6	7.5	6.1	5.8	7	8.5	ND 250	270	ND 250	100 J	99 J
1,1-Dichloroethene (1,1-DCE)	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.13	ND 0.13	ND 0.26	ND 0.26	ND 250	ND 250	ND 250	ND 33	ND 33
1,1-Dichloropropene	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.12	ND 0.12	ND 0.24	ND 0.24	ND 250	ND 250	ND 250	ND 30	ND 30
1,2,3-Trichlorobenzene	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.4	ND 0.4	ND 0.8	ND 0.8	ND 500	ND 500	ND 500	ND 100	ND 100
1,2,3-Trichloropropane	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.13	ND 0.13	ND 0.26	ND 0.26	ND 500	ND 500	ND 500	ND 33	ND 33
1,2,4-Trichlorobenzene	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.25	ND 0.25	ND 0.5	ND 0.5 *+	ND 500	ND 500	ND 500	ND 63	ND 63
1,2,4-Trimethylbenzene	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.32	ND 0.32	ND 0.64	ND 0.64	ND 500	ND 500	ND 500	ND 80	ND 80
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.2	ND 0.2	ND 0.4	ND 0.4	ND 500	ND 500	ND 500 *+	ND 50	ND 50
1,2-Dibromoethane (EDB)	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.12	ND 0.12	ND 0.24	ND 0.24	ND 250	ND 250	ND 250	ND 30	ND 30
1,2-Dichlorobenzene	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.097	ND 0.097	ND 0.19	ND 0.19	ND 250	ND 250	ND 250	ND 24	ND 24
1,2-Dichloroethane	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.14	ND 0.14	ND 0.28	ND 0.28	ND 250	ND 250	ND 250	ND 35	ND 35
1,2-Dichloropropane	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.15	ND 0.15	ND 0.3	ND 0.3	ND 250	ND 250	ND 250	ND 38	ND 38
1,3,5-Trimethylbenzene	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.16	ND 0.16	ND 0.32	ND 0.32	ND 250	ND 250	ND 250	ND 40	ND 40
1,3-Dichlorobenzene	µg/L	ND 5	ND 2	ND 4.0	ND 0.5	ND 0.086	ND 0.086	ND 0.17	ND 0.17	ND 250	ND 250	ND 250	ND 22	ND 22
1,3-Dichloropropane	µg/L	ND 10	ND 4	ND 2.0	ND 1	ND 0.1	ND 0.1	ND 0.2	ND 0.2	ND 500	ND 500	ND 500	ND 25	ND 25
1,4-Dichlorobenzene	µg/L	ND 5	ND 2	ND 4.0	ND 0.5	ND 0.083	ND 0.083	ND 0.17	ND 0.17	ND 250	ND 250	ND 250	ND 21	ND 21
2,2-Dichloropropane	µg/L	ND 10	ND 4	ND 8.0	ND 1	ND 0.46	ND 0.46	ND 0.92	ND 0.92	ND 500	ND 500	ND 500	ND 120	ND 120
2-Butanone (MEK)	µg/L	ND 20	ND 8	ND 2.0	3.8	2.9	1.1 J	ND 0.66	ND 0.66	ND 1000	ND 1000	ND 1000	ND 83	ND 83
2-Chlorotoluene	µg/L	ND 5	ND 2	ND 8.0	ND 0.5	ND 0.11	ND 0.11	ND 0.22	ND 0.22	ND 250	ND 250	ND 250	ND 28	ND 28
2-Hexanone	µg/L	ND 20	ND 8	ND 2.0	ND 2	ND 0.17	ND 0.17	ND 0.34	ND 0.34	ND 1000	ND 1000	ND 1000	ND 43	ND 43
4-Chlorotoluene	µg/L	ND 5	ND 2	ND 4.0	ND 0.5	ND 0.1	ND 0.1	ND 0.2	ND 0.2	ND 250	ND 250	ND 250	ND 25	ND 25
4-Isopropyltoluene	µg/L	ND 10	ND 4	ND 8.0	ND 1	ND 0.15	ND 0.15	ND 0.3	ND 0.3	ND 500	ND 500	ND 500	ND 38	ND 38
Acetone	µg/L	ND 100	ND 40	ND 40	32	16	ND 3.8	ND 7.6	ND 7.6	ND 5000	ND 5000	ND 5000	ND 950	ND 950
Benzene	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.08	ND 0.08	ND 0.16	ND 0.16	ND 250	ND 250	ND 250	ND 20	ND 20
Bromobenzene	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.091	ND 0.091	ND 0.18	ND 0.18	ND 500	ND 500	ND 500	ND 23	ND 23
Bromochloromethane	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.18	ND 0.18	ND 0.36	ND 0.36	ND 500	ND 500	ND 500	ND 45	ND 45
Bromodichloromethane	µg/L	ND 5	ND 2	ND 4.0	ND 0.5	ND 0.14	ND 0.14	ND 0.28	ND 0.28	ND 250	ND 250	ND 250	ND 35	ND 35
Bromoform	µg/L	ND 10	ND 4	ND 8.0	ND 1	ND 0.19	ND 0.19	ND 0.38	ND 0.38	ND 500	ND 500	ND 500	ND 48	ND 48
Bromomethane	µg/L	ND 10	ND 4	ND 2.0	ND 1	ND 0.21	ND 0.21	ND 0.42	ND 0.42	ND 500	ND 500	ND 500	ND 53	ND 53
Carbon Disulfide	µg/L	ND 20	ND 8	ND 2.0	ND 2	ND 0.36	ND 0.36	ND 0.72	ND 0.72	ND 1000	ND 1000	ND 1000	ND 90	ND 90
Carbon Tetrachloride	µg/L	ND 5	ND 2	ND 4.0	ND 0.5	ND 0.12	ND 0.12	ND 0.24	ND 0.24	ND 250	ND 250	ND 250	ND 30	ND 30
Chlorobenzene	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.07	ND 0.07	ND 0.14	ND 0.14	ND 250	ND 250	ND 250	ND 18	ND 18
Chloroethane	µg/L	ND 10	ND 4	ND 4.0	ND 1	1.7	5.3	4.2	4	ND 500	ND 500	ND 500	ND 60	ND 60
Chloroform	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.12	ND 0.12	ND 0.24	ND 0.24	ND 500	ND 500	ND 500	ND 30	ND 30
Chloromethane	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.26	ND 0.26	ND 0.52	ND 0.52	ND 500	ND 500	ND 500	ND 65	ND 65
cis-1,2-Dichloroethene	µg/L	390	190	200	15	4	4.8	21	25	25000	23000	17000	1900	1900
cis-1,3-Dichloropropene	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.15	ND 0.15	ND 0.3	ND 0.3	ND 250	ND 250	ND 250	ND 38	ND 38
Dibromochloromethane	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.16	ND 0.16	ND 0.32	ND 0.32	ND 250	ND 250	ND 250	ND 40	ND 40
Dibromomethane	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.17	ND 0.17	ND 0.34	ND 0.34	ND 250	ND 250	ND 250	ND 43	ND 43
Dichlorodifluoromethane (CFC 12)	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.32	ND 0.32	ND 0.64	ND 0.64	630	ND 500	ND 500	180 J	160 J
Ethylbenzene	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.084	ND 0.084	ND 0.17	ND 0.17	ND 250	ND 250	ND 250	ND 21	ND 21
Hexachlorobutadiene	µg/L	ND 10	ND 4	ND 2.0	ND 1	ND 0.23	ND 0.23	ND 0.46	ND 0.46 *+	ND 500	ND 500	ND 500	ND 58	ND 58
Isopropylbenzene	µg/L	ND 5	ND 2	ND 4.0	ND 0.5	ND 0.11	ND 0.11	ND 0.22	ND 0.22	ND 250	ND 250	ND 250	ND 28	ND 28
Methyl Isobutyl Ketone	µg/L	ND 20	ND 8	ND 2.0	ND 2	ND 0.11	ND 0.11	ND 0.22	ND 0.22	ND 1000	ND 1000	ND 1000	ND 28	ND 28
Methylene Chloride	µg/L	ND 10	ND 4	ND 2.0	ND 1	ND 0.16	ND 0.16	ND 0.32	ND 0.32	ND 500	ND 500	ND 500	ND 40	ND 40
MTBE	µg/L	ND 5	ND 2	ND 4.0	ND 0.5	ND 0.12	ND 0.12	ND 0.24	ND 0.24	ND 250	ND 250	ND 250	ND 30	ND 30
Naphthalene	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.48	ND 0.48	ND 0.96	ND 0.96	ND 500	ND 500	ND 500	ND 120	ND 120
n-Butylbenzene	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.18	ND 0.18	ND 0.36	ND 0.36	ND 500	ND 500	ND 500	ND 45	ND 45
n-Propylbenzene	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.11	ND 0.11	ND 0.22	ND 0.22	ND 500	ND 500	ND 500	ND 28	ND 28
sec-Butylbenzene	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.14	ND 0.14	ND 0.28	ND 0.28	ND 500	ND 500	ND 500	ND 35	ND 35
Styrene	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.13	ND 0.13	ND 0.26	ND 0.26	ND 250	ND 250	ND 250	ND 33	ND 33
tert-Butylbenzene	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.13	ND 0.13	ND 0.26	ND 0.26	ND 500	ND 500	ND 500	ND 33	ND 33
Tetrachloroethene (PCE)	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.1	ND 0.1	ND 0.2	ND 0.2	ND 250	ND 250	ND 250	ND 25	ND 25
Toluene	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.095	ND 0.095	ND 0.19	ND 0.19	ND 250	ND 250	ND 250	ND 24	27 J
trans-1,2-Dichloroethene	µg/L	ND 5	4.3	4.5	6.4	5.7	4.9	4.6	5.3	ND 250	ND 250	ND 250	ND 28	ND 28
trans-1,3-Dichloropropene	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.16	ND 0.16	ND 0.32	ND 0.32	ND 250	ND 250	ND 250	ND 40	ND 40
Trichloroethene (TCE)	µg/L	18	ND 2	ND 2.0	ND 0.5	0.52	1.1	0.81 J	1.2	6800	ND 250	ND 250	ND 25	ND 25
Trichlorofluoromethane (CFC 11)	µg/L	ND 10	ND 4	ND 4.0	ND 1	ND 0.13	ND 0.13	ND 0.26	ND 0.26	ND 500	ND 500	ND 500	ND 33	ND 33
Vinyl Acetate	µg/L	ND 20	ND 8	ND 8.0	ND 2	ND 0.19	ND 0.19	ND 0.38	ND 0.38 *+	ND 1000	ND 1000	ND 1000	ND 48	ND 48
Vinyl Chloride	µg/L	37	180	190	110	37	23	77	130	460	480	1200	9700	9700
Xylenes, Total	µg/L	ND 5	ND 2	ND 2.0	ND 0.5	ND 0.27	ND 0.27	ND 0.54	ND 0.54	ND 250	ND 250	ND 250	ND 68	ND 68
SM 5310C - TOTAL ORGANIC CARBON														
Total Organic Carbon	mg/L	--	110	--	85	19	4.7	4 .0	4.7	2.3	94	74	43	--
SM 4500S2 -D - SULFIDE														
Sulfide	mg/L	--	ND 0.05 F1	--	ND 0.05 ^1+	ND 0.022	0.024 J	0.34	0.088	0.35	1.7	3	4.1	--
SM 2320B - ALKALINITY														
Bicarbonate Alkalinity	mg/L	--	270	--	230	300	370	660	770	350	420	420	430	--
Carbonate Hydroxide	mg/L	--	ND 5	--	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	--
Hydroxide Alkalinity	mg/L	--	ND 5	--	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	--
Total Alkalinity	mg/L	--	270	--	230	300	370	660	770	350	420	420	430	--
EPA 300.0 - NITRATE AND SULFATE														
Nitrate	mg/L	--	ND 0.25	--	ND 0.25	ND 0.1	ND 0.1	ND 0.5	ND 0.5	ND 0.25	ND 0.1	ND 1.3	ND 0.024	--
Sulfate	mg/L	--	ND 1	--	1.6	0.9 J	4.4	25	46	160	1	ND 5	1.4	--
EPA 200.7 - ARSENIC AND MANGANESE														
Arsenic	µg/L	--	--	--	ND 15	11 J	5.3 J	ND 4.4	ND 19 H	--	--	ND 15	ND 4.4	--
Manganese	µg/L	--	--	--	6400	8800	8600	6100	5100 H	--	--	1800	1100	--
AM20GAX - HYDROGEN														
Hydrogen	nM	--	15	--	4.5	2.2	2.2	15	0.90 J	0.61 J	210	59	10	--
AM23G - VOLATILE FATTY ACIDS														
4-Methylpentanoic Acid	mg/L	--	--	--	ND 0.056	ND 0.056	ND 0.056	ND 0.56	ND 0.56	ND 0.056	--	ND 0.056	ND 0.056	--
Acetic Acid	mg/L	--	170	--	150	22	0.18 J	5.7	3 J	1.6	160	130	75	--
Butyric Acid	mg/L	--	9.6	--	5.4	0.68	ND 0.058	ND 0.58	ND 0.58	ND 0.058	9.5	6.8	2.9	--
Formic Acid	mg/L	--	1.9	--	0.99	4.8	6	46	49	4.8	1.4	0.7	4.9	--
i-Hexanoic Acid	mg/L	--	ND 0.11	--	0.8	ND 0.058	ND 0.058	ND 0.58	0.7 J	0.12 J	ND 0.056	0.65	0.25 J	--
Isopentanoic Acid	mg/L	--	1.2	--	0.72	0.38 J	ND 0.061	ND 0.61	ND 0.61	ND 0.061	0.26 J	0.31 J	0.2 J	--
Lactic Acid	mg/L	--	ND 0.11	--	2.9	ND 0.053	ND 0.053	ND 0.53	6.9	ND 0.053	ND 1.1	4.3	ND 0.053	--
Pentanoic Acid	mg/L	--	0.67 J	--	ND 0.056	ND 0.056	ND 0.056	ND 0.56	ND 0.56	ND 0.056	0.45 J	ND 0.056	ND 0.056	--
Propionic Acid	mg/L	--	6.2	--	1.4 J	1.3	ND 0.053	0.53 J	ND 0.53	0.056 J	2.8 J	3.1	1.5 J	--
Pyruvic Acid	mg/L	--	0.84 J	--	0.38 J	ND 0.06	ND 0.06	ND 0.6	ND 0.6	ND 0.06	0.31 J	0.32 J	0.15 J	--
RSK175 - DISSOLVED GASES														
Carbon Dioxide	mg/L	--	23	--	26.9	60.4	39.3	124	155	20	102	5.62	44.7	--
Ethane	mg/L	--	0.0031	--	0.0013	0.0008 J	0.0024	0.011	0.031	0.015	0.026	0.029	0.016	--
Ethene	mg/L	--	0.089	--	0.17	0.14	0.14	0.18	0.21	0.74	1.4	0.86	1.1	--
Methane	mg/L	--	4.3	--	12	18	9.1	9.5	9.2	0.56	3.4	2.6	1.6	--
QuantArray-Chlor - MICROBIAL														
APS	Cells/mL	--	--	--	--	53700	--	438000	85200	22100	--	--	159000	--
BVC	Cells/mL	--	--	--	--	<0.6	--	<0.5	<0.5	< 0.5	--	--	<0.5	--
CER	Cells/mL	--	--	--	--	89.6	--	1070	402	< 4.7	--	--	59	--
CFR	Cells/mL	--	--	--	--	<5.7	--	<4.6	<4.7	< 4.7	--	--	<5	--
DCA	Cells/mL	--	--	--	--	<5.7	--	<4.6	<4.7	< 4.7	--	--	<5	--
DCAR	Cells/mL	--	--	--	--	<5.7	--	<4.6	<4.7	< 4.7	--	--	<5	--
DCM	Cells/mL	--	--	--	--	<5.7	--	<4.6	312	< 4.7	--	--	<5	--
DCMA	Cells/mL	--	--	--	--	<5.7	--	<4.6	<4.7	< 4.7	--	--	<5	--
DECO	Cells/mL	--	--	--	--	7240	--	17600	4060	696	--	--	36500	--
DHBt	Cells/mL	--	--	--	--	10200	--	19000	660	8840	--	--	9730	--
DHC	Cells/mL	--	--	--	--	33600	--	80000	18500	4670	--	--	423000	--
DHG	Cells/mL	--	--	--	--	3360	--	40400	17600	< 4.7	--	--	979	--
DSB	Cells/mL	--	--	--	--	9850	--	52200	<4.7	13500	--	--	3630	--
DSM	Cells/mL	--	--	--	--	68.2	--	3150	<4.7	7900	--	--	11700	--
EBAC	Cells/mL	--	--	--	--	8160000	--	14700000	2080000	606000	--	--	5180000	--
EtnC	Cells/mL	--	--	--	--	<5.7	--	<4.6	<4.7	209	--	--	<5	--
EtnE	Cells/mL	--	--	--	--	<5.7	--	255	18.2	194	--	--	46.8	--
MGN	Cells/mL	--	--	--	--	224000	--	32000	6660	3.6 J	--	--	4.2 J	--
PCE-1	Cells/mL	--	--	--	--	<5.7	--	<4.6	<4.7	35.3	--	--	<5	--
PCE-2	Cells/mL	--	--	--	--	<5.7	--	17.1	<4.7	8080	--	--	146	--
PHE	Cells/mL	--	--	--	--	574	--	722	149	9.6	--	--	3140	--
RDEG	Cells/mL	--	--	--	--	5050	--	1340	728	< 4.7	--	--	6530	--
RMO	Cells/mL	--	--	--	--	3040	--	1380	<4.7	< 4.7	--	--	<5	--
SMMO	Cells/mL	--	--	--	--	<5.7	--	4130	16800	42.7	--	--	68.4	--
TCBO	Cells/mL	--	--	--	--	<5.7	--	<4.6	<4.7	< 4.7	--	--	<5	--
TCE	Cells/mL	--	--	--	--	3950	--	11000	2880	1150	--	--	101000	--
TDR	Cells/mL	--	--	--	--	<5.7	--	<4.6	<4.7	< 4.7	--	--	<5	--
TOD	Cells/mL	--	--	--	--	<5.7	--	<4.6	227	774	--	--	9.8	--
VCR	Cells/mL	--	--	--	--	2400	--	7160	2260	1420	--	--	2010	--

For definitions and abbreviations please refer to the notes on page 12.

ED_013761_00000157-00152

TABLE 6
GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID		S138A	S138A	S138A	S138A	S138A	S139A	S139A	S139A	S139A	S139A	S139A	S139A	S139A
Sample Date		5/19/21	8/19/21	8/19/21	11/10/21	11/10/21	9/16/20	12/17/20	1/18/21	2/16/21	5/18/21	5/18/21	8/18/21	11/10/21
Sample Purpose		REG	REG	FD	REG	FD	REG	REG	REG	REG	REG	REG	REG	REG
Analysis Type		INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	REANL	INIT	INIT
Parameter	Result Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 8260B - VOLATILE ORGANIC COMPOUNDS														
1,1,1,2-Tetrachloroethane	µg/L	ND 2 H	ND 5	ND 5	ND 10	ND 10	ND 5	ND 1	ND 10	ND 2	ND 10	ND 5 H	ND 10	ND 5
1,1,1-Trichloroethane (TCA)	µg/L	520 H	290	290	410	410	ND 5	ND 1	ND 10	ND 2	ND 17	ND 8.5 H	ND 17	ND 8.5
1,1,2,2-Tetrachloroethane	µg/L	ND 2 H	ND 5	ND 5	ND 10	ND 10	ND 5	ND 1	ND 10	ND 2.2	ND 10	ND 5 H	ND 10	ND 5
1,1,2-Trichloroethane	µg/L	ND 2.2 H	ND 5.5	ND 5.5	ND 11	ND 11	ND 5	ND 1	ND 10	ND 2.4	ND 11	ND 5.5 H	ND 11	ND 5.5
1,1,2-Trichlorotrifluoroethane (CFC 113)	µg/L	ND 2.4 H	ND 6	ND 6	ND 12	ND 12	17	1.1	ND 10	ND 3.4	ND 12	ND 6 H	ND 12	ND 6
1,1-Dichloroethane (1,1-DCA)	µg/L	84 H	77	79	98	94	7.4	29	45	23	29 J	26 H	27 J	20 J
1,1-Dichloroethene (1,1-DCE)	µg/L	40 H	26	25	47 J	31 J	ND 5	ND 1	ND 10	ND 2.6	ND 13	ND 6.5 H	ND 13	ND 6.5
1,1-Dichloropropene	µg/L	ND 2.4 H	ND 6	ND 6	ND 12	ND 12	ND 5	ND 1	ND 10	ND 2.4	ND 12	ND 6 H	ND 12	ND 6
1,2,3-Trichlorobenzene	µg/L	ND 8 H	ND 20	ND 20	ND 40	ND 40	ND 10	ND 2	ND 20	ND 8	ND 40	ND 20 H	ND 40	ND 20
1,2,3-Trichloropropane	µg/L	ND 2.6 H	ND 6.5	ND 6.5	ND 13	ND 13	ND 10	ND 2	ND 20	ND 2.6	ND 13	ND 6.5 H	ND 13	ND 6.5
1,2,4-Trichlorobenzene	µg/L	ND 5 H	ND 13	ND 13	ND 25	ND 25	ND 10	ND 2	ND 20	ND 5	ND 25	ND 13 H	ND 25	ND 13
1,2,4-Trimethylbenzene	µg/L	ND 6.4 H	ND 16	ND 16	ND 32	ND 32	ND 10	ND 2	ND 20	ND 6.4	ND 32	ND 16 H	ND 32	ND 16
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	ND 4 H	ND 10	ND 10	ND 20	ND 20	ND 10	ND 2	ND 20	ND 4	ND 20	ND 10 H	ND 20	ND 10
1,2-Dibromoethane (EDB)	µg/L	ND 2.4 H	ND 6	ND 6	ND 12	ND 12	ND 5	ND 1	ND 10	ND 2.4	ND 12	ND 6 H	ND 12	ND 6
1,2-Dichlorobenzene	µg/L	3.9 J,H	ND 4.9	ND 4.9	ND 9.7	ND 9.7	ND 5	3	ND 10	2.2 J	ND 9.7	ND 4.9 H	ND 9.7	ND 4.9
1,2-Dichloroethane	µg/L	ND 2.8 H	ND 7	ND 7	ND 14	ND 14	ND 5	ND 1	ND 10	ND 2.8	ND 14	ND 7 H	ND 14	17 J
1,2-Dichloropropane	µg/L	ND 3 H	ND 7.5	ND 7.5	ND 15	ND 15	ND 5	ND 1	ND 10	ND 3	ND 15	ND 7.5 H	ND 15	ND 7.5
1,3,5-Trimethylbenzene	µg/L	ND 3.2 H	ND 8	ND 8	ND 16	ND 16	ND 5	ND 1	ND 10	ND 3.2	ND 16	ND 8 H	ND 16	ND 8
1,3-Dichlorobenzene	µg/L	ND 1.7 H	ND 4.3	ND 4.3	ND 8.6	ND 8.6	ND 5	ND 1	ND 10	ND 1.7	ND 8.6	ND 4.3 H	ND 8.6	ND 4.3
1,3-Dichloropropane	µg/L	ND 2 H	ND 5	ND 5	ND 10	ND 10	ND 10	ND 2	ND 20	ND 2	ND 10	ND 5 H	ND 10	ND 5
1,4-Dichlorobenzene	µg/L	ND 1.7 H	ND 4.2	ND 4.2	ND 8.3	ND 8.3	ND 5	ND 1	ND 10	ND 1.7	ND 8.3	ND 4.2 H	ND 8.3	ND 4.2
2,2-Dichloropropane	µg/L	ND 9.2 H	ND 23	ND 23	ND 46	ND 46	ND 10	ND 2	ND 20	ND 9.2	ND 46	ND 23 H	ND 46	ND 23
2-Butanone (MEK)	µg/L	ND 6.6 H	ND 17	ND 17	ND 33	ND 33	ND 20	4.4	ND 40	ND 6.6	ND 33	ND 17 H	ND 33	ND 17
2-Chlorotoluene	µg/L	ND 2.2 H	ND 5.5	ND 5.5	ND 11	ND 11	ND 5	ND 1	ND 10	ND 2.2	ND 11	ND 5.5 H	ND 11	ND 5.5
2-Hexanone	µg/L	ND 3.4 H	ND 8.5	ND 8.5	ND 17	ND 17	ND 20	ND 4	ND 40	ND 3.4	ND 17	ND 8.5 H	ND 17	ND 8.5
4-Chlorotoluene	µg/L	ND 2 H	ND 5	ND 5	ND 10	ND 10	ND 5	ND 1	ND 10	ND 2	ND 10	ND 5 H	ND 10	ND 5
4-Isopropyltoluene	µg/L	ND 3 H	ND 7.5	ND 7.5	ND 15	ND 15	ND 10	ND 2	ND 20	ND 3	ND 15	ND 7.5 H	ND 15	ND 7.5
Acetone	µg/L	ND 76 H	ND 190	ND 190	ND 380	ND 380	ND 100	20	ND 200	ND 76	ND 380	ND 190 H	ND 380	ND 190
Benzene	µg/L	ND 1.6 H	ND 4	ND 4	ND 8	ND 8	ND 5	ND 1	ND 10	ND 1.6	ND 8	ND 4 H	ND 8	ND 4
Bromobenzene	µg/L	ND 1.8 H	ND 4.6	ND 4.6	ND 9.1	ND 9.1	ND 10	ND 2	ND 20	ND 1.8	ND 9.1	ND 4.6 H	ND 9.1	ND 4.6
Bromochloromethane	µg/L	ND 3.6 H	ND 9	ND 9	ND 18	ND 18	ND 10	ND 2	ND 20	ND 3.6	ND 18	ND 9 H	ND 18	ND 9
Bromodichloromethane	µg/L	ND 2.8 H	ND 7	ND 7	ND 14	ND 14	ND 5	ND 1	ND 10	ND 2.8	ND 14	ND 7 H	ND 14	ND 7
Bromoform	µg/L	ND 3.8 H	ND 9.5	ND 9.5	ND 19	ND 19	ND 10	ND 2	ND 20	ND 3.8 *+	ND 19	ND 9.5 H	ND 19	ND 9.5
Bromomethane	µg/L	ND 4.2 H	ND 11	ND 11	ND 21	ND 21	ND 10	ND 2	ND 20	ND 4.2	ND 21	ND 11 H	ND 21	ND 11
Carbon Disulfide	µg/L	ND 7.2 H	ND 18	ND 18	ND 36	ND 36	ND 20	ND 4	ND 40	ND 7.2	ND 36	ND 18 H	ND 36	ND 18
Carbon Tetrachloride	µg/L	ND 2.4 H	ND 6	ND 6	ND 12	ND 12	ND 5	ND 1	ND 10	ND 2.4	ND 12	ND 6 H	ND 12	ND 6
Chlorobenzene	µg/L	ND 1.4 H	ND 3.5	ND 3.5	ND 7	ND 7	ND 5	ND 1	ND 10	ND 1.4	ND 7	ND 3.5 H	ND 7	ND 3.5
Chloroethane	µg/L	ND 4.8 H	ND 12	ND 12	ND 24	ND 24	16	ND 2	ND 20	ND 4.8	ND 24	ND 12 H	ND 24	ND 12
Chloroform	µg/L	ND 2.4 H	ND 6	ND 6	ND 12	ND 12	ND 10	ND 2	ND 20	ND 2.4	ND 12	ND 6 H	ND 12	ND 6
Chloromethane	µg/L	ND 5.2 H	ND 13	ND 13	ND 26	ND 26	ND 10	ND 2	ND 20	ND 5.2	ND 26	ND 13 H	ND 26	ND 13
cis-1,2-Dichloroethene	µg/L	3900 H	2400	2400	4500	3500	410	9.2	690	740	3900	--	3300	2000
cis-1,3-Dichloropropene	µg/L	ND 3 H	ND 7.5	ND 7.5	ND 15	ND 15	ND 5	ND 1	ND 10	ND 3	ND 15	ND 7.5 H	ND 15	ND 7.5
Dibromochloromethane	µg/L	ND 3.2 H	ND 8	ND 8	ND 16	ND 16	ND 5	ND 1	ND 10	ND 3.2	ND 16	ND 8 H	ND 16	ND 8
Dibromomethane	µg/L	ND 3.4 H	ND 8.5	ND 8.5	ND 17	ND 17	ND 5	ND 1	ND 10	ND 3.4	ND 17	ND 8.5 H	ND 17	ND 8.5
Dichlorodifluoromethane (CFC 12)	µg/L	210 H	ND 16	ND 16	ND 32	ND 32	12	ND 2	ND 20	ND 6.4	ND 32	ND 16 H	ND 32	ND 16
Ethylbenzene	µg/L	ND 1.7 H	ND 4.2	ND 4.2	ND 8.4	ND 8.4	ND 5	ND 1	ND 10	ND 1.7	ND 8.4	ND 4.2 H	ND 8.4	ND 4.2
Hexachlorobutadiene	µg/L	ND 4.6 H	ND 12	ND 12	ND 23	ND 23	ND 10	ND 2	ND 20	ND 4.6 *+	ND 23	ND 12 H	ND 23	ND 12
Isopropylbenzene	µg/L	ND 2.2 H	ND 5.5	ND 5.5	ND 11	ND 11	ND 5	ND 1	ND 10	ND 2.2	ND 11	ND 5.5 H	ND 11	ND 5.5
Methyl Isobutyl Ketone	µg/L	ND 2.2 H	ND 5.5	ND 5.5	ND 11	ND 11	ND 20	ND 4	ND 40	ND 2.2	ND 11	ND 5.5 H	ND 11	ND 5.5
Methylene Chloride	µg/L	ND 3.2 H	ND 8	ND 8	ND 16	ND 16	ND 10	ND 2	ND 20	ND 3.2	ND 16	21 J,H,B	ND 16	ND 8
MTBE	µg/L	ND 2.4 H	ND 6	ND 6	ND 12	ND 12	ND 5	ND 1	ND 10	ND 2.4	ND 12	ND 6 H	ND 12	ND 6
Naphthalene	µg/L	ND 9.6 H	ND 24	ND 24	ND 48	ND 48	ND 10	ND 2	ND 20	ND 9.6	ND 48	ND 24 H	ND 48	ND 24
n-Butylbenzene	µg/L	ND 3.6 H	ND 9	ND 9	ND 18	ND 18	ND 10	ND 2	ND 20	ND 3.6	ND 18	ND 9 H	ND 18	ND 9
n-Propylbenzene	µg/L	ND 2.2 H	ND 5.5	ND 5.5	ND 11	ND 11	ND 10	ND 2	ND 20	ND 2.2	ND 11	ND 5.5 H	ND 11	ND 5.5
sec-Butylbenzene	µg/L	ND 2.8 H	ND 7	ND 7	ND 14	ND 14	ND 10	ND 2	ND 20	ND 2.8	ND 14	ND 7 H	ND 14	ND 7
Styrene	µg/L	ND 2.6 H	ND 6.5	ND 6.5	ND 13	ND 13	ND 5	ND 1	ND 10	ND 2.6	ND 13	ND 6.5 H	ND 13	ND 6.5
tert-Butylbenzene	µg/L	ND 2.6 H	ND 6.5	ND 6.5	ND 13	ND 13	ND 10	ND 2	ND 20	ND 2.6	ND 13	ND 6.5 H	ND 13	ND 6.5
Tetrachloroethene (PCE)	µg/L	ND 2 H	ND 5	ND 5	ND 10	ND 10	ND 5	ND 1	ND 10	ND 2	ND 10	ND 5 H	ND 10	ND 5
Toluene	µg/L	2.1 J,H	ND 4.8	ND 4.8	ND 9.5	ND 9.5	ND 5	ND 1	ND 10	ND 1.9	ND 9.5	ND 4.8 H	ND 9.5	ND 4.8
trans-1,2-Dichloroethene	µg/L	29 H	26	27	33 J	31 J	7.6	14	15	13	17 J	15 J,H	ND 11	11 J
trans-1,3-Dichloropropene	µg/L	ND 3.2 H	ND 8	ND 8	ND 16	ND 16	ND 5	ND 1	ND 10	ND 3.2	ND 16	ND 8 H	ND 16	ND 8
Trichloroethene (TCE)	µg/L	16 H	88	86	ND 10	ND 10	17	1.2	ND 10	6.6 J	24 J	14 J,H	20 J	12 J
Trichlorofluoromethane (CFC 11)	µg/L	ND 2.6 H	ND 6.5	ND 6.5	ND 13	ND 13	ND 10	ND 2	ND 20	ND 2.6	ND 13	ND 6.5 H	ND 13	ND 6.5
Vinyl Acetate	µg/L	ND 3.8 H	ND 9.5	ND 9.5	ND 19	ND 19	ND 20	ND 4	ND 40	ND 3.8	ND 19	ND 9.5 H	ND 19	ND 9.5
Vinyl Chloride	µg/L	2900 H	990	1000	2000	1800	310	140	660	480	610	530 H	570	580
Xylenes, Total	µg/L	ND 5.4 H	ND 14	ND 14	ND 27	ND 27	ND 5	ND 1	ND 10	ND 5.4	ND 27	ND 14 H	ND 27	ND 14
SM 5310C - TOTAL ORGANIC CARBON														
Total Organic Carbon	mg/L	40	41	41	18	22	2.0	94	68	22	5.4	--	4.9	3.2
SM 4500S2-D - SULFIDE														
Sulfide	mg/L	5.9	2.1	2.4	1.9	1.9	ND 0.1	0.81	1.4 H	0.39	ND 0.022	--	ND 0.022	0.11 F2,F1
SM 2320B - ALKALINITY														
Bicarbonate Alkalinity	mg/L	410	410	410	420	430	430	660	750	890	760	--	810	600
Carbonate Hydroxide	mg/L	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	--	ND 5	ND 5
Hydroxide Alkalinity	mg/L	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	--	ND 5	ND 5
Total Alkalinity	mg/L	410	410	410	420	430	430	660	750	890	760	--	810	600
EPA 300.0 - NITRATE AND SULFATE														
Nitrate	mg/L	ND 0.1	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 1.3 ,H	ND 1.3	ND 1.3	ND 0.88	ND 0.5	--	ND 0.5	ND 0.5
Sulfate	mg/L	2.3	4.5 J	4.3 J	1.9 J	1.9 J	190	ND 5	8.8	9	81	--	57	120
EPA 200.7 - ARSENIC AND MANGANESE														
Arsenic	µg/L	6.3 J	4.4 J	ND 4.4	ND 19 H	ND 19 H	--	--	ND 15	34	43	--	63	44 J,H
Manganese	µg/L	950	9100	1700	1400 H	1600 H	--	--	6100	6900	5200	--	4300 B	4000 H
AM20GAX - HYDROGEN														
Hydrogen	nM	3.9	2.0	---	2.5	---	2.2	3.1	1.2 J	1.2 J	4.2	---	0.96 J	1.2 J
AM23G - VOLATILE FATTY ACIDS														
4-Methylpentanoic Acid	mg/L	ND 0.056	ND 0.56	---	ND 0.56	---	ND 0.056	---	ND 0.056	ND 0.056	ND 0.11	---	ND 0.56	ND 0.56
Acetic Acid	mg/L	75	83	---	20	---	0.61	180	130	29	0.37 J	---	6	2.2 J
Butyric Acid	mg/L	2.1	3.3 J	---	ND 0.58	---	ND 0.058	4.8	4.4	0.53	ND 0.12	---	ND 0.58	ND 0.58
Formic Acid	mg/L	6.9	54	---	52	---	4.8	0.89	0.59	5	11	---	52	49
i-Hexanoic Acid	mg/L	0.18 J	ND 0.58	---	ND 0.58	---	ND 0.058	ND 0.056	0.11 J	ND 0.058	ND 0.12	---	ND 0.58	ND 0.58
Isopentanoic Acid	mg/L	ND 0.061	ND 0.61	---	ND 0.61	---	ND 0.061	0.36 J	0.081 J	ND 0.061	ND 0.12	---	ND 0.61	ND 0.61
Lactic Acid	mg/L	ND 0.053	ND 0.53	---	5	---	ND 0.053	ND 1.1	ND 1.1	ND 0.053	ND 0.11	---	ND 0.53	54
Pentanoic Acid	mg/L	ND 0.056	ND 0.56	---	ND 0.56	---	ND 0.056	0.34 J	ND 0.056	ND 0.056	ND 0.11	---	ND 0.56	ND 0.56
Propionic Acid	mg/L	0.86	1 J	---	ND 0.53	---	0.091 J	5.5 J	3.4	1.3	ND 0.11	---	0.67 J	ND 0.53
Pyruvic Acid	mg/L	ND 0.06	ND 0.6	---	ND 0.6	---	ND 0.06	0.29 J	0.072 J	ND 0.06	ND 0.12	---	ND 0.6	ND 0.6
RSK175 - DISSOLVED GASES														
Carbon Dioxide	mg/L	56	85.1	---	84.7	---	78.7	97	99.2	---	108	---	6.83	121
Ethane	mg/L	0.012	0.012	---	0.014	---	0.0028	0.0063	0.0041	0.0034	0.006	---	0.0088	0.01
Ethene	mg/L	2	2	---	2.4	---	0.072	1.5	1.4	1.3	0.73	---	0.76	0.61
Methane	mg/L	4.5	6.3	---	5.6	---	8.1	8.7	14	13	7.6	---	6.8	7.6
QuantArray-Chlor - MICROBIAL														
APS	Cells/mL	---	371000	---	127000	---	70900	---	---	311000	---	---	221000	283000
BVC	Cells/mL	---	<0.6	---	<0.5	---	< 0.5	---	---	<0.9	---	---	<0.5	<0.5
CER	Cells/mL	---	183	---	39.2	---	1710	---	---	688	---	---	3380	1040
CFR	Cells/mL	---	<5.7	---	<5.2	---	< 4.6	---	---	<9.3	---	---	<4.6	<4.8
DCA	Cells/mL	---	<5.7	---	<5.2	---	< 4.6	---	---	<9.3	---	---	<4.6	<4.8
DCAR	Cells/mL	---	<5.7	---	<5.2	---	< 4.6	---	---	<9.3	---	---	<4.6	<4.8
DCM	Cells/mL	---	<5.7	---	<5.2	---	< 4.6	---	---	<9.3	---	---	504	1950
DCMA	Cells/mL	---	<5.7	---	<5.2	---	< 4.6	---	---	<9.3	---	---	<4.6	<4.8
DECO	Cells/mL	---	349000	---	23100	---	1010	---	---	25200	---	---	5290	7650
DHBt	Cells/mL	---	54500	---	25800	---	1300	---	---	44500	---	---	31800	60700
DHC	Cells/mL	---	738000	---	1220000	---	582	---	---	339000	---	---	44400	23600
DHG	Cells/mL	---	1560	---	640	---	61900	---	---	10100	---	---	57200	48600
DSB	Cells/mL	---	708	---	40100	---	3770	---	---	14100	---	---	75400	99800
DSM	Cells/mL	---	1020	---	<5.2	---	< 4.6	---	---	39700	---	---	126	<4.8
EBAC	Cells/mL	---	15500000	---	5780000	---	2050000	---	---	21400000	---	---	12800000	7130000
EtnC	Cells/mL	---	30.3	---	31.8	---	275	---	---	165	---	---	2000	235
EtnE	Cells/mL	---	<5.7	---	<5.2	---	474	---	---	<9.3	---	---	3800	652
MGN	Cells/mL	---	23300	---	17900	---	383	---	---	27700	---	---	8510	27500
PCE-1	Cells/mL	---	2980	---	1400	---	< 4.6	---	---	<9.3	---	---	<4.6	<4.8
PCE-2	Cells/mL	---	637	---	4720	---	52.8	---	---	<9.3	---	---	<4.6	187
PHE	Cells/mL	---	23400	---	4390	---	24.5	---	---	1200	---	---	48	66.1
RDEG	Cells/mL	---	23800	---	7370	---	< 4.6	---	---	4540	---	---	424	422
RMO	Cells/mL	---	<5.7	---	<5.2	---	< 4.6	---	---	8810	---	---	<4.6	<4.8
SMMO	Cells/mL	---	1630	---	699	---	1690	---	---	2360	---	---	652	1100
TCBO	Cells/mL	---	<5.7	---	<5.2	---	< 4.6	---	---	<9.3	---	---	<4.6	<4.8
TCE	Cells/mL	---	107000	---	225000	---	158	---	---	78600	---	---	7510	5460
TDR	Cells/mL	---	<5.7	---	<5.2	---	< 4.6	---	---	<9.3	---	---	<4.6	<4.8
TOD	Cells/mL	---	<5.7	---	<5.2	---	38.1	---	---	<9.3	---	---	<4.6	<4.8
VCR	Cells/mL	---	30900	---	71600	---	115	---	---	36300	---	---	3620	4150

For definitions and abbreviations please refer to the notes on page 12.

ED_013761_00000157-00153

TABLE 6
GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID		S140A	S140A	S140A	S140A	S140A	S140A	S140A	S141A	S141A	S141A	S141A	S141A	S141A
Sample Date		9/16/20	12/18/20	1/20/21	2/17/21	5/17/21	8/19/21	11/10/21	9/15/20	12/16/20	1/19/21	2/16/21	5/19/21	8/18/21
Sample Purpose		REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG
Analysis Type		INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT
Parameter	Result Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 8260B - VOLATILE ORGANIC COMPOUNDS														
1,1,1,2-Tetrachloroethane	µg/L	ND 1000	ND 500	ND 1300	ND 100	ND 40 H	ND 100	ND 200	ND 25	ND 25	ND 25	ND 2.5	ND 0.2 H	ND 2
1,1,1-Trichloroethane (TCA)	µg/L	ND 1000	ND 500	ND 1300	ND 100	740 H	660	630 J	ND 25	ND 25	ND 25	ND 2.5	120 H	120
1,1,2,2-Tetrachloroethane	µg/L	ND 1000	ND 500	ND 1300	ND 110	ND 40 H	ND 100	ND 200	ND 25	ND 25	ND 25	ND 2.8	2 H	ND 2
1,1,2-Trichloroethane	µg/L	ND 1000	ND 500	ND 1300	ND 120	ND 44 H	ND 110	ND 220	ND 25	ND 25	ND 25	ND 3	ND 0.22 H	ND 2.2
1,1,2-Trichlorotrifluoroethane (CFC 113)	µg/L	ND 1000	980	ND 1300	740	ND 48 H	ND 120	ND 240	240	72	48	22	ND 0.24 H	ND 2.4
1,1-Dichloroethane (1,1-DCA)	µg/L	ND 1000	ND 500	ND 1300	390 J	430 H	340 J	340 J	ND 25	ND 25	ND 25	10 J	11 H	5.1 J
1,1-Dichloroethene (1,1-DCE)	µg/L	ND 1000	ND 500	ND 1300	360 J	380 H	340 J	ND 260	ND 25	ND 25	ND 25	ND 3.3	4 H	ND 2.6
1,1-Dichloropropene	µg/L	ND 1000	ND 500	ND 1300	ND 120	ND 48 H	ND 120	ND 240	ND 25	ND 25	ND 25	ND 3	ND 0.24 H	ND 2.4
1,2,3-Trichlorobenzene	µg/L	ND 2000	ND 1000	ND 2500	ND 400	ND 160 H	ND 400	ND 800	ND 50	ND 50	ND 50	ND 10	ND 0.8 H	ND 8
1,2,3-Trichloropropane	µg/L	ND 2000	ND 1000	ND 2500	ND 130	ND 52 H	ND 130	ND 260	ND 50	ND 50	ND 50	ND 3.3	ND 0.26 H	ND 2.6
1,2,4-Trichlorobenzene	µg/L	ND 2000	ND 1000	ND 2500	ND 250	ND 100 H	ND 250	ND 500	ND 50	ND 50	ND 50	ND 6.3	ND 0.5 H	ND 5
1,2,4-Trimethylbenzene	µg/L	ND 2000	ND 1000	ND 2500	ND 320	ND 130 H	ND 320	ND 640	ND 50	ND 50	ND 50	ND 8	ND 0.64 H	ND 6.4
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	ND 2000	ND 1000	ND 2500 *+	ND 200	ND 80 H	ND 200	ND 400	ND 50	ND 50	ND 50	ND 5	ND 0.4 H	ND 4
1,2-Dibromoethane (EDB)	µg/L	ND 1000	ND 500	ND 1300	ND 120	ND 48 H	ND 120	ND 240	ND 25	ND 25	ND 25	ND 3	ND 0.24 H	ND 2.4
1,2-Dichlorobenzene	µg/L	ND 1000	ND 500	ND 1300	ND 97	ND 39 H	ND 97	ND 190	ND 25	ND 25	ND 25	ND 2.4	0.49 J,H	ND 1.9
1,2-Dichloroethane	µg/L	ND 1000	ND 500	ND 1300	ND 140	ND 56 H	ND 140	ND 280	ND 25	ND 25	ND 25	ND 3.5	ND 0.28 H	ND 2.8
1,2-Dichloropropane	µg/L	ND 1000	ND 500	ND 1300	ND 150	ND 60 H	ND 150	ND 300	ND 25	ND 25	ND 25	ND 3.8	ND 0.3 H	ND 3
1,3,5-Trimethylbenzene	µg/L	ND 1000	ND 500	ND 1300	ND 160	ND 64 H	ND 160	ND 320	ND 25	ND 25	ND 25	ND 4	ND 0.32 H	ND 3.2
1,3-Dichlorobenzene	µg/L	ND 1000	ND 500	ND 1300	ND 86	ND 34 H	ND 86	ND 170	ND 25	ND 25	ND 25	ND 2.2	ND 0.17 H	ND 1.7
1,3-Dichloropropane	µg/L	ND 2000	ND 1000	ND 2500	ND 100	ND 40 H	ND 100	ND 200	ND 50	ND 50	ND 50	ND 2.5	ND 0.2 H	ND 2
1,4-Dichlorobenzene	µg/L	ND 1000	ND 500	ND 1300	ND 83	ND 33 H	ND 83	ND 170	ND 25	ND 25	ND 25	ND 2.1	ND 0.17 H	ND 1.7
2,2-Dichloropropane	µg/L	ND 2000	ND 1000	ND 2500	ND 460	ND 180 H	ND 460	ND 920	ND 50	ND 50	ND 50	ND 12	ND 0.92 H	ND 9.2
2-Butanone (MEK)	µg/L	ND 4000	ND 2000	ND 5000	ND 330	ND 130 H	ND 330	ND 660	ND 100	ND 100	ND 100	ND 8.3	ND 0.66 H	ND 6.6
2-Chlorotoluene	µg/L	ND 1000	ND 500	ND 1300	ND 110	ND 44 H	ND 110	ND 220	ND 25	ND 25	ND 25	ND 2.8	ND 0.22 H	ND 2.2
2-Hexanone	µg/L	ND 4000	ND 2000	ND 5000	ND 170	ND 68 H	ND 170	ND 340	ND 100	ND 100	ND 100	ND 4.3	ND 0.34 H	ND 3.4
4-Chlorotoluene	µg/L	ND 1000	ND 500	ND 1300	ND 100	ND 40 H	ND 100	ND 200	ND 25	ND 25	ND 25	ND 2.5	ND 0.2 H	ND 2
4-Isopropyltoluene	µg/L	ND 2000	ND 1000	ND 2500	ND 150	ND 60 H	ND 150	ND 300	ND 50	ND 50	ND 50	ND 3.8	ND 0.3 H	ND 3
Acetone	µg/L	ND 20000	ND 10000	ND 25000	ND 3800	ND 1500 H	ND 3800	ND 7600	ND 500	ND 500	ND 500	ND 95	ND 7.6 H	ND 76
Benzene	µg/L	ND 1000	ND 500	ND 1300	ND 80	ND 32 H	ND 80	ND 160	ND 25	ND 25	ND 25	ND 2	ND 0.16 H	ND 1.6
Bromobenzene	µg/L	ND 2000	ND 1000	ND 2500	ND 91	ND 36 H	ND 91	ND 180	ND 50	ND 50	ND 50	ND 2.3	ND 0.18 H	ND 1.8
Bromochloromethane	µg/L	ND 2000	ND 1000	ND 2500	ND 180	ND 72 H	ND 180	ND 360	ND 50	ND 50	ND 50	ND 4.5	ND 0.36 H	ND 3.6
Bromodichloromethane	µg/L	ND 1000	ND 500	ND 1300	ND 140	ND 56 H	ND 140	ND 280	ND 25	ND 25	ND 25	ND 3.5	ND 0.28 H	ND 2.8
Bromoform	µg/L	ND 2000	ND 1000	ND 2500	ND 190	ND 76 H	ND 190	ND 380	ND 50	ND 50	ND 50	ND 4.8 *+	ND 0.38 H	ND 3.8
Bromomethane	µg/L	ND 2000	ND 1000	ND 2500	ND 210	ND 84 H	ND 210	ND 420	ND 50	ND 50	ND 50	ND 5.3	ND 0.42 H	ND 4.2
Carbon Disulfide	µg/L	ND 4000	ND 2000	ND 5000	ND 360	ND 140 H	ND 360	ND 720	ND 100	ND 100	ND 100	ND 9	ND 0.72 H	ND 7.2
Carbon Tetrachloride	µg/L	ND 1000	ND 500	ND 1300	ND 120	ND 48 H	ND 120	ND 240	ND 25	ND 25	ND 25	ND 3	ND 0.24 H	ND 2.4
Chlorobenzene	µg/L	ND 1000	ND 500	ND 1300	ND 70	ND 28 H	ND 70	ND 140	ND 25	ND 25	ND 25	ND 1.8	ND 0.14 H	ND 1.4
Chloroethane	µg/L	ND 2000	ND 1000	ND 2500	ND 240	ND 96 H	ND 240	ND 480	ND 50	ND 50	ND 50	ND 6	8.7 H	14 J
Chloroform	µg/L	ND 2000	ND 1000	ND 2500	ND 120	ND 48 H	ND 120	ND 240	ND 50	ND 50	ND 50	ND 3	ND 0.24 H	ND 2.4
Chloromethane	µg/L	ND 2000	ND 1000	ND 2500	ND 260	ND 100 H	ND 260	ND 520	ND 50	ND 50	ND 50	ND 6.5	ND 0.52 H	ND 5.2
cis-1,2-Dichloroethene	µg/L	50000	44000	57000	48000	55000 H	48000	53000	560	1800	1500	1300	1200 H	710
cis-1,3-Dichloropropene	µg/L	ND 1000	ND 500	ND 1300	ND 150	ND 60 H	ND 150	ND 300	ND 25	ND 25	ND 25	ND 3.8	ND 0.3 H	ND 3
Dibromochloromethane	µg/L	ND 1000	ND 500	ND 1300	ND 160	ND 64 H	ND 160	ND 320	ND 25	ND 25	ND 25	ND 4	ND 0.32 H	ND 3.2
Dibromomethane	µg/L	ND 1000	ND 500	ND 1300	ND 170	ND 68 H	ND 170	ND 340	ND 25	ND 25	ND 25	ND 4.3	ND 0.34 H	ND 3.4
Dichlorodifluoromethane (CFC 12)	µg/L	ND 2000	ND 1000	ND 2500	530 J	720 H	ND 320	ND 640	ND 50	ND 50	ND 50	ND 8	12 H	ND 6.4
Ethylbenzene	µg/L	ND 1000	ND 500	ND 1300	ND 84	ND 34 H	ND 84	ND 170	ND 25	ND 25	ND 25	ND 2.1	ND 0.17 H	ND 1.7
Hexachlorobutadiene	µg/L	ND 2000	ND 1000	ND 2500	ND 230	ND 92 H	ND 230	ND 460	ND 50	ND 50	ND 50	ND 5.8 *+	ND 0.46 H	ND 4.6
Isopropylbenzene	µg/L	ND 1000	ND 500	ND 1300	ND 110	ND 44 H	ND 110	ND 220	ND 25	ND 25	ND 25	ND 2.8	ND 0.22 H	ND 2.2
Methyl Isobutyl Ketone	µg/L	ND 4000	ND 2000	ND 5000	ND 110	ND 44 H	ND 110	ND 220	ND 100	ND 100	ND 100	ND 2.8	ND 0.22 H	ND 2.2
Methylene Chloride	µg/L	ND 2000	ND 1000	ND 2500	ND 160	ND 64 H	ND 160	ND 320	ND 50	ND 50	ND 50	ND 4	ND 0.32 H	ND 3.2
MTBE	µg/L	ND 1000	ND 500	ND 1300	ND 120	ND 48 H	ND 120	ND 240	ND 25	ND 25	ND 25	ND 3	ND 0.24 H	ND 2.4
Naphthalene	µg/L	ND 2000	ND 1000	ND 2500	ND 480	ND 190 H	ND 480	ND 960	ND 50	ND 50	ND 50	ND 12	ND 0.96 H	ND 9.6
n-Butylbenzene	µg/L	ND 2000	ND 1000	ND 2500	ND 180	ND 72 H	ND 180	ND 360	ND 50	ND 50	ND 50	ND 4.5	ND 0.36 H	ND 3.6
n-Propylbenzene	µg/L	ND 2000	ND 1000	ND 2500	ND 110	ND 44 H	ND 110	ND 220	ND 50	ND 50	ND 50	ND 2.8	ND 0.22 H	ND 2.2
sec-Butylbenzene	µg/L	ND 2000	ND 1000	ND 2500	ND 140	ND 56 H	ND 140	ND 280	ND 50	ND 50	ND 50	ND 3.5	ND 0.28 H	ND 2.8
Styrene	µg/L	ND 1000	ND 500	ND 1300	ND 130	ND 52 H	ND 130	ND 260	ND 25	ND 25	ND 25	ND 3.3	ND 0.26 H	ND 2.6
tert-Butylbenzene	µg/L	ND 2000	ND 1000	ND 2500	ND 130	ND 52 H	ND 130	ND 260	ND 50	ND 50	ND 50	ND 3.3	ND 0.26 H	ND 2.6
Tetrachloroethene (PCE)	µg/L	ND 1000	ND 500	ND 1300	ND 100	ND 40 H	ND 100	ND 200	ND 25	ND 25	ND 25	ND 2.5	0.85 J,H	2 J
Toluene	µg/L	ND 1000	ND 500	ND 1300	ND 95	ND 38 H	ND 95	ND 190	ND 25	ND 25	ND 25	ND 2.4	ND 0.19 H	ND 1.9
trans-1,2-Dichloroethene	µg/L	ND 1000	ND 500	ND 1300	ND 110	180 J,H	110 J	ND 220	ND 25	ND 25	ND 25	4.4 J	11 H	5.9 J
trans-1,3-Dichloropropene	µg/L	ND 1000	ND 500	ND 1300	ND 160	ND 64 H	ND 160	ND 320	ND 25	ND 25	ND 25	ND 4	ND 0.32 H	ND 3.2
Trichloroethene (TCE)	µg/L	15000	ND 500	2300	6400	1600 H	110 J	ND 200	1400	260	230	220	250 H	730
Trichlorofluoromethane (CFC 11)	µg/L	ND 2000	ND 1000	ND 2500	ND 130	ND 52 H	ND 130	ND 260	ND 50	ND 50	ND 50	ND 3.3	ND 0.26 H	ND 2.6
Vinyl Acetate	µg/L	ND 4000	ND 2000	ND 5000	ND 190	ND 76 H	ND 190	ND 380	ND 100	ND 100	ND 100	ND 4.8	ND 0.38 H	ND 3.8
Vinyl Chloride	µg/L	ND 1000	3300	2400	1600	1700 H	2600	2800	25	140	260	210	150 H	120
Xylenes, Total	µg/L	ND 1000	ND 500	ND 1300	ND 270	ND 110 H	ND 270	ND 540	ND 25	ND 25	ND 25	ND 6.8	ND 0.54 H	ND 5.4
SM 5310C - TOTAL ORGANIC CARBON														
Total Organic Carbon	mg/L	1.9	45 F1	3.5	1.2	2.3	2.4	2.5	1.8	9.7	12	9.4	7.1	4.7
SM 4500S2-D - SULFIDE														
Sulfide	mg/L	ND 0.1	3.6	0.6	0.047 J	0.03 J	0.45	0.74	ND 0.1	0.15	ND 0.05 H	0.023 J	0.41	ND 0.022
SM 2320B - ALKALINITY														
Bicarbonate Alkalinity	mg/L	390	610	460	420	420	510	510	490	900	1100	1100	1200	990
Carbonate Hydroxide	mg/L	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5
Hydroxide Alkalinity	mg/L	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5
Total Alkalinity	mg/L	390	610	460	420	420	510	510	490	900	1100	1100	1200	990
EPA 300.0 - NITRATE AND SULFATE														
Nitrate	mg/L	ND 1.3 ,H	ND 0.1	ND 1.3	ND 0.024	ND 0.5	ND 0.5	ND 0.5	ND 0.1	ND 1.3	ND 1.3	ND 1.3	ND 0.5	ND 0.5
Sulfate	mg/L	170	73	130	150	140	94	79	1.8	89	57	61	32	27
EPA 200.7 - ARSENIC AND MANGANESE														
Arsenic	µg/L	--	--	ND 15	ND 4.4	ND 4.4	17	22 J,H	--	--	ND 15	8.7 J	4.8 J	5.6 J
Manganese	µg/L	--	--	440	260	240	650	590 H	--	--	2100	1800	1700	1300 B
AM20GAX - HYDROGEN														
Hydrogen	nM	0.52 J	0.93 J	0.71 J	5.4	4.6	1.0 J	1.4 J	1.5 J	7.3	2.0	0.75 J	4.4	0.95 J
AM23G - VOLATILE FATTY ACIDS														
4-Methylpentanoic Acid	mg/L	ND 0.056	--	ND 0.056	ND 0.056	ND 0.056	ND 0.56	ND 0.56	ND 0.056	--	ND 0.056	ND 0.56	ND 0.056	ND 0.56
Acetic Acid	mg/L	0.33 J	48	1.1	0.35 J	0.31 J	5.5	2.2 J	0.51	12	13	13	0.49 J	5.4
Butyric Acid	mg/L	ND 0.058	1.1	ND 0.058	ND 0.058	ND 0.058	ND 0.58	ND 0.58	ND 0.058	ND 0.29	0.064 J	ND 0.58	ND 0.058	ND 0.58
Formic Acid	mg/L	5.3	0.66	0.41 J	4.8	5.3	44	48	ND 0.055	1.6 J	0.41 J	48	11	46
i-Hexanoic Acid	mg/L	0.17 J	ND 0.056	0.17 J	ND 0.058	ND 0.058	ND 0.58	0.59 J	ND 0.058	ND 0.28	0.15 J	ND 0.58	ND 0.058	ND 0.58
Isopentanoic Acid	mg/L	ND 0.061	0.23 J	ND 0.061	ND 0.061	ND 0.061	ND 0.61	ND 0.61	ND 0.061	ND 0.3	ND 0.061	ND 0.61	ND 0.061	ND 0.61
Lactic Acid	mg/L	ND 0.053	ND 1.1	ND 0.053	ND 0.053	ND 0.053	ND 0.53	10	ND 0.053	0.44 J	ND 0.053	ND 0.53	ND 0.053	ND 0.53
Pentanoic Acid	mg/L	ND 0.056	0.78	ND 0.056	ND 0.056	ND 0.056	ND 0.56	ND 0.56	ND 0.056	ND 0.28	ND 0.056	ND 0.56	ND 0.056	ND 0.56
Propionic Acid	mg/L	ND 0.053	24	ND 0.053	ND 0.053	ND 0.053	0.58 J	ND 0.53	0.058 J	ND 0.26	0.19 J	ND 0.53	ND 0.053	0.55 J
Pyruvic Acid	mg/L	ND 0.06	0.77	ND 0.06	ND 0.06	ND 0.06	ND 0.6	ND 0.6	ND 0.06	ND 0.3	ND 0.06	ND 0.6	ND 0.06	ND 0.6
RSK175 - DISSOLVED GASES														
Carbon Dioxide	mg/L	22.8	60.6	30.9	29.4	27	30.8	40.1	61.3	154	204	162	245	193
Ethane	mg/L	0.042	0.074	0.083	0.068	0.015	ND 0.00017	ND 0.00017	0.0013	0.0046	0.0081	0.0057	0.0038	ND 0.00017
Ethene	mg/L	0.58	1.8	1.7	1.4	1.1	1.6	2	0.0079	0.15	0.58	0.4	0.67	0.45
Methane	mg/L	0.25	1.6	0.98	0.88	0.52	0.97	0.89	0.44	1	3	3.2	5.6	7.6
QuantArray-Chlor - MICROBIAL														
APS	Cells/mL	15700	---	---	550000	---	71200	67900	1440	---	---	58000	---	63700
BVC	Cells/mL	< 0.5	--	--	<0.5	--	<0.5	<0.5	< 0.5	--	--	<0.5	--	<0.5
CER	Cells/mL	< 4.6	--	--	<4.7	--	286	251	< 4.6	--	--	354	--	349
CFR	Cells/mL	< 4.6	--	--	<4.7	--	<4.6	<4.7	< 4.6	--	--	<4.7	--	<4.6
DCA	Cells/mL	< 4.6	---	---	<4.7	---	<4.6	<4.7	< 4.6	---	---	<4.7	---	<4.6
DCAR	Cells/mL	< 4.6	--	--	<4.7	--	<4.6	<4.7	< 4.6	--	--	<4.7	--	<4.6
DCM	Cells/mL	< 4.6	--	--	<4.7	--	<4.6	<4.7	< 4.6	--	--	<4.7	--	1570
DCMA	Cells/mL	< 4.6	--	--	<4.7	--	<4.6	<4.7	< 4.6	--	--	<4.7	--	<4.6
DECO	Cells/mL	1320	--	--	9170	--	1450	994	1710	--	--	2940	--	85800
DHBt	Cells/mL	15300	--	--	26200	--	13300	28100	355	--	--	60100	--	66800
DHC	Cells/mL	30.2	---	---	166000	---	181000	252000	6.5	---	---	59200	---	68400
DHG	Cells/mL	< 4.6	--	--	<4.7	--	2180	<4.7	< 4.6	--	--	15200	--	17700
DSB	Cells/mL	16500	--	--	28500	--	31700	15400	10600	--	--	25100	--	93400
DSM	Cells/mL	10700	--	--	79200	--	14300	24200	< 4.6	--	--	736	--	106000
EBAC	Cells/mL	1360000	---	---	12100000	---	5800000	4680000	1700000	---	---	6080000	---	15900000
EtnC	Cells/mL	2100	--	--	7490	--	18600	9550	91	--	--	16.2	--	981
EtnE	Cells/mL	3170	--	--	3160	--	21500	26700	580	--	--	<4.7	--	5030
MGN	Cells/mL	25	---	---	8650	---	2810	872	< 4.6	---	---	11000	---	398
PCE-1	Cells/mL	< 4.6	--	--	114	--	<4.6	<4.7	< 4.6	--	--	37.2	--	34.3
PCE-2	Cells/mL	23800	--	--	26200	--	399000	250000	< 4.6	--	--	9740	--	12400
PHE	Cells/mL	320	---	---	1090	---	156	151	118	---	---	891	---	485
RDEG	Cells/mL	1600	--	--	1480	--	392	310	< 4.6	--	--	11100	--	1100
RMO	Cells/mL	< 4.6	--	--	7490	--	339	78.7	34.4	--	--	<4.7	--	583
SMMO	Cells/mL	< 4.6	--	--	442	--	424	624	< 4.6	--	--	156	--	290
TCBO	Cells/mL	< 4.6	---	---	<4.7	---	<4.6	<4.7	< 4.6	---	---	<4.7	---	<4.6
TCE	Cells/mL	12.5	--	--	29400	--	30300	62000	< 0.5	--	--	9310	--	10800
TDR	Cells/mL	< 4.6	--	--	<4.7	--	<4.6	<4.7	< 4.6	--	--	<4.7	--	<4.6
TOD	Cells/mL	207	---	---	903	---	336	464	< 4.6	---	---	<4.7	---	<4.6
VCR	Cells/mL	2	--	--	614	--	10400	23800	< 0.5	--	--	4750	--	4790

For definitions and abbreviations please refer to the notes on page 12.

ED_013761_00000157-00154

TABLE 6
GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID		S141A	S143A	S143A	S143A	S143A	S143A	S143A	S143A	S146A	S146A	S146A	S146A	S146A
Sample Date		11/9/21	9/15/20	12/16/20	1/19/21	2/15/21	5/17/21	8/17/21	11/9/21	9/16/20	12/17/20	1/20/21	2/16/21	5/19/21
Sample Purpose		REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG
Analysis Type		INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT
Parameter	Result Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 8260B - VOLATILE ORGANIC COMPOUNDS														
1,1,1,2-Tetrachloroethane	µg/L	ND 1 *+	ND 10	ND 25	ND 2.5	ND 0.1	ND 0.1	ND 0.1	ND 0.4	ND 50	ND 100	ND 200	ND 20	ND 5 H
1,1,1-Trichloroethane (TCA)	µg/L	51	ND 10	ND 25	ND 2.5	ND 0.1	0.46 J	0.78	ND 0.68	ND 50	ND 100	ND 200	ND 20	3400 H
1,1,2,2-Tetrachloroethane	µg/L	ND 1	ND 10	ND 25	ND 2.5	ND 0.11	ND 0.1	ND 0.1	ND 0.4	ND 50	ND 100	ND 200	ND 22	ND 5 H
1,1,2-Trichloroethane	µg/L	ND 1.1	ND 10	ND 25	ND 2.5	ND 0.12	ND 0.11	ND 0.11	ND 0.44	ND 50	ND 100	ND 200	ND 24	ND 5.5 H
1,1,2-Trichlorotrifluoroethane (CFC 113)	µg/L	ND 1.2	11	ND 25	ND 2.5	ND 0.17	ND 0.12	ND 0.12	ND 0.48	4300	4200	4800	3800	ND 6 H
1,1-Dichloroethane (1,1-DCA)	µg/L	5.1	ND 10	ND 25	6.2	2.6	2	2.4	4.2	58	ND 100	ND 200	54 J	66 H
1,1-Dichloroethene (1,1-DCE)	µg/L	1.3 J	ND 10	ND 25	ND 2.5	ND 0.13	ND 0.13	ND 0.13	ND 0.52	94	ND 100	ND 200	74 J	81 H
1,1-Dichloropropene	µg/L	ND 1.2	ND 10	ND 25	ND 2.5	ND 0.12	ND 0.12	ND 0.12	ND 0.48	ND 50	ND 100	ND 200	ND 24	ND 6 H
1,2,3-Trichlorobenzene	µg/L	ND 4	ND 20	ND 50	ND 5	ND 0.4	ND 0.4	ND 0.4	ND 1.6	ND 100	ND 200	ND 400	ND 80	ND 20 H
1,2,3-Trichloropropane	µg/L	ND 1.3	ND 20	ND 50	ND 5	ND 0.13	ND 0.13	ND 0.13	ND 0.52	ND 100	ND 200	ND 400	ND 26	ND 6.5 H
1,2,4-Trichlorobenzene	µg/L	ND 2.5	ND 20	ND 50	ND 5	ND 0.25	ND 0.25	ND 0.25	ND 1	ND 100	ND 200	ND 400	ND 50	ND 13 H
1,2,4-Trimethylbenzene	µg/L	ND 3.2	ND 20	ND 50	ND 5	ND 0.32	ND 0.32	ND 0.32	ND 1.3	ND 100	ND 200	ND 400	ND 64	ND 16 H
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	ND 2	ND 20	ND 50	ND 5	ND 0.2	ND 0.2	ND 0.2	ND 0.8	ND 100	ND 200	ND 400 *+	ND 40	ND 10 H
1,2-Dibromoethane (EDB)	µg/L	ND 1.2	ND 10	ND 25	ND 2.5	ND 0.12	ND 0.12	ND 0.12	ND 0.48	ND 50	ND 100	ND 200	ND 24	ND 6 H
1,2-Dichlorobenzene	µg/L	ND 0.97	ND 10	ND 25	ND 2.5	0.13 J	0.15 J	0.2 J	ND 0.39	50	ND 100	ND 200	54 J	51 H
1,2-Dichloroethane	µg/L	ND 1.4	ND 10	ND 25	ND 2.5	ND 0.14	ND 0.14	ND 0.14	ND 0.56	ND 50	ND 100	ND 200	ND 28	ND 7 H
1,2-Dichloropropane	µg/L	ND 1.5	ND 10	ND 25	ND 2.5	ND 0.15	ND 0.15	ND 0.15	ND 0.6	ND 50	ND 100	ND 200	ND 30	ND 7.5 H
1,3,5-Trimethylbenzene	µg/L	ND 1.6	ND 10	ND 25	ND 2.5	ND 0.16	ND 0.16	ND 0.16	ND 0.64	ND 50	ND 100	ND 200	ND 32	ND 8 H
1,3-Dichlorobenzene	µg/L	ND 0.86	ND 10	ND 25	ND 2.5	ND 0.086	ND 0.086	ND 0.086	ND 0.34	ND 50	ND 100	ND 200	ND 17	ND 4.3 H
1,3-Dichloropropane	µg/L	ND 1	ND 20	ND 50	ND 5	ND 0.1	ND 0.1	ND 0.1	ND 0.4	ND 100	ND 200	ND 400	ND 20	ND 5 H
1,4-Dichlorobenzene	µg/L	ND 0.83	ND 10	ND 25	ND 2.5	ND 0.083	ND 0.083	ND 0.083	ND 0.33	ND 50	ND 100	ND 200	ND 17	ND 4.2 H
2,2-Dichloropropane	µg/L	ND 4.6	ND 20	ND 50	ND 5	ND 0.46	ND 0.46	ND 0.46	ND 1.8	ND 100	ND 200	ND 400	ND 92	ND 23 H
2-Butanone (MEK)	µg/L	ND 3.3	ND 40	ND 100	ND 10	3.2	ND 0.33	ND 0.33	ND 1.3	ND 200	ND 400	ND 800	ND 66	ND 17 H
2-Chlorotoluene	µg/L	ND 1.1	ND 10	ND 25	ND 2.5	ND 0.11	ND 0.11	ND 0.11	ND 0.44	ND 50	ND 100	ND 200	ND 22	ND 5.5 H
2-Hexanone	µg/L	ND 1.7	ND 40	ND 100	ND 10	ND 0.17	ND 0.17	ND 0.17	ND 0.68	ND 200	ND 400	ND 800	ND 34	ND 8.5 H
4-Chlorotoluene	µg/L	ND 1	ND 10	ND 25	ND 2.5	ND 0.1	ND 0.1	ND 0.1	ND 0.4	ND 50	ND 100	ND 200	ND 20	ND 5 H
4-Isopropyltoluene	µg/L	ND 1.5	ND 20	ND 50	ND 5	ND 0.15	ND 0.15	ND 0.15	ND 0.6	ND 100	ND 200	ND 400	ND 30	ND 7.5 H
Acetone	µg/L	ND 38	ND 200	ND 500	ND 50	13	ND 3.8	ND 3.8	ND 15	ND 1000	ND 2000	ND 4000	ND 760	ND 190 H
Benzene	µg/L	ND 0.8	ND 10	ND 25	ND 2.5	ND 0.08	ND 0.08	ND 0.08	ND 0.32	ND 50	ND 100	ND 200	ND 16	ND 4 H
Bromobenzene	µg/L	ND 0.91	ND 20	ND 50	ND 5	ND 0.091	ND 0.091	ND 0.091	ND 0.36	ND 100	ND 200	ND 400	ND 18	ND 4.6 H
Bromochloromethane	µg/L	ND 1.8	ND 20	ND 50	ND 5	ND 0.18	ND 0.18	ND 0.18	ND 0.72	ND 100	ND 200	ND 400	ND 36	ND 9 H
Bromodichloromethane	µg/L	ND 1.4	ND 10	ND 25	ND 2.5	ND 0.14	ND 0.14	ND 0.14	ND 0.56	ND 50	ND 100	ND 200	ND 28	ND 7 H
Bromoform	µg/L	ND 1.9 *+	ND 20	ND 50	ND 5	ND 0.19	ND 0.19	ND 0.19	ND 0.76	ND 100	ND 200	ND 400	ND 38 *+	ND 9.5 H
Bromomethane	µg/L	ND 2.1	ND 20	ND 50	ND 5	ND 0.21	ND 0.21	ND 0.21	ND 0.84	ND 100	ND 200	ND 400	ND 42	ND 11 H
Carbon Disulfide	µg/L	ND 3.6	ND 40	ND 100	ND 10	ND 0.36	ND 0.36	ND 0.36	ND 1.4	ND 200	ND 400	ND 800	ND 72	ND 18 H
Carbon Tetrachloride	µg/L	ND 1.2 *+	ND 10	ND 25	ND 2.5	ND 0.12	ND 0.12	ND 0.12	ND 0.48	ND 50	ND 100	ND 200	ND 24	ND 6 H
Chlorobenzene	µg/L	ND 0.7	ND 10	ND 25	ND 2.5	ND 0.07	ND 0.07	ND 0.07	ND 0.28	ND 50	ND 100	ND 200	ND 14	ND 3.5 H
Chloroethane	µg/L	24	ND 20	ND 50	ND 5	2.6	12	8.8	7.5	ND 100	ND 200	ND 400	ND 48	ND 12 H
Chloroform	µg/L	ND 1.2	ND 20	ND 50	ND 5	ND 0.12	ND 0.12	ND 0.12	ND 0.48	ND 100	ND 200	ND 400	ND 24	ND 6 H
Chloromethane	µg/L	ND 2.6	ND 20	ND 50	ND 5	ND 0.26	ND 0.26	ND 0.26	ND 1	ND 100	ND 200	ND 400	ND 52	ND 13 H
cis-1,2-Dichloroethene	µg/L	620	590	1800	21	4.3	15	1.8	24	4200	8500	11000	7500	7700 H
cis-1,3-Dichloropropene	µg/L	ND 1.5	ND 10	ND 25	ND 2.5	ND 0.15	ND 0.15	ND 0.15	ND 0.6	ND 50	ND 100	ND 200	ND 30	ND 7.5 H
Dibromochloromethane	µg/L	ND 1.6	ND 10	ND 25	ND 2.5	ND 0.16	ND 0.16	ND 0.16	ND 0.64	ND 50	ND 100	ND 200	ND 32	ND 8 H
Dibromomethane	µg/L	ND 1.7	ND 10	ND 25	ND 2.5	ND 0.17	ND 0.17	ND 0.17	ND 0.68	ND 50	ND 100	ND 200	ND 34	ND 8.5 H
Dichlorodifluoromethane (CFC 12)	µg/L	ND 3.2	ND 20	ND 50	ND 5	ND 0.32	ND 0.32	ND 0.32	ND 1.3	300	ND 200	ND 400	230	290 H
Ethylbenzene	µg/L	ND 0.84	ND 10	ND 25	ND 2.5	ND 0.084	ND 0.084	ND 0.084	ND 0.34	ND 50	ND 100	ND 200	ND 17	ND 4.2 H
Hexachlorobutadiene	µg/L	ND 2.3 *+	ND 20	ND 50	ND 5	ND 0.23	ND 0.23	ND 0.23	ND 0.92	ND 100	ND 200	ND 400	ND 46 *+	ND 12 H
Isopropylbenzene	µg/L	ND 1.1	ND 10	ND 25	ND 2.5	ND 0.11	ND 0.11	ND 0.11	ND 0.44	ND 50	ND 100	ND 200	ND 22	ND 5.5 H
Methyl Isobutyl Ketone	µg/L	ND 1.1	ND 40	ND 100	ND 10	ND 0.11	ND 0.11	ND 0.11	ND 0.44	ND 200	ND 400	ND 800	ND 22	ND 5.5 H
Methylene Chloride	µg/L	ND 1.6	ND 20	ND 50	ND 5	ND 0.16	ND 0.16	ND 0.16	ND 0.64	ND 100	ND 200	ND 400	ND 32	ND 8 H
MTBE	µg/L	ND 1.2	ND 10	ND 25	ND 2.5	ND 0.12	ND 0.12	ND 0.12	ND 0.48	ND 50	ND 100	ND 200	ND 24	ND 6 H
Naphthalene	µg/L	ND 4.8	ND 20	ND 50	ND 5	ND 0.48	ND 0.48	ND 0.48	ND 1.9	ND 100	ND 200	ND 400	ND 96	ND 24 H
n-Butylbenzene	µg/L	ND 1.8	ND 20	ND 50	ND 5	ND 0.18	ND 0.18	ND 0.18	ND 0.72	ND 100	ND 200	ND 400	ND 36	ND 9 H
n-Propylbenzene	µg/L	ND 1.1	ND 20	ND 50	ND 5	ND 0.11	ND 0.11	ND 0.11	ND 0.44	ND 100	ND 200	ND 400	ND 22	ND 5.5 H
sec-Butylbenzene	µg/L	ND 1.4	ND 20	ND 50	ND 5	ND 0.14	ND 0.14	ND 0.14	ND 0.56	ND 100	ND 200	ND 400	ND 28	ND 7 H
Styrene	µg/L	ND 1.3	ND 10	ND 25	ND 2.5	ND 0.13	ND 0.13	ND 0.13	ND 0.52	ND 50	ND 100	ND 200	ND 26	ND 6.5 H
tert-Butylbenzene	µg/L	ND 1.3	ND 20	ND 50	ND 5	ND 0.13	ND 0.13	ND 0.13	ND 0.52	ND 100	ND 200	ND 400	ND 26	ND 6.5 H
Tetrachloroethene (PCE)	µg/L	1.1 J	ND 10	ND 25	ND 2.5	ND 0.1	0.11 J	0.22 J	ND 0.4	ND 50	ND 100	ND 200	ND 20	7.3 J,H
Toluene	µg/L	ND 0.95	ND 10	ND 25	ND 2.5	ND 0.095	ND 0.095	ND 0.095	ND 0.38	ND 50	ND 100	ND 200	ND 19	ND 4.8 H
trans-1,2-Dichloroethene	µg/L	7.4	ND 10	ND 25	11	6.6	4.4	5.7	7.3	ND 50	ND 100	ND 200	ND 22	21 J,H
trans-1,3-Dichloropropene	µg/L	ND 1.6	ND 10	ND 25	ND 2.5	ND 0.16	ND 0.16	ND 0.16	ND 0.64	ND 50	ND 100	ND 200	ND 32	ND 8 H
Trichloroethene (TCE)	µg/L	400	840	ND 25	ND 2.5	1.3	5.4	3.4	9.7	5700	350	ND 200	890	910 H
Trichlorofluoromethane (CFC 11)	µg/L	ND 1.3	ND 20	ND 50	ND 5	ND 0.13	ND 0.13	ND 0.13	ND 0.52	ND 100	ND 200	ND 400	ND 26	ND 6.5 H
Vinyl Acetate	µg/L	ND 1.9	ND 40	ND 100	ND 10	ND 0.19	ND 0.19	ND 0.19	ND 0.76	ND 200	ND 400	ND 800	ND 38	ND 9.5 H
Vinyl Chloride	µg/L	100	ND 10	420	12	5.2	17	9.9	220	ND 50	340	230	540	1100 H
Xylenes, Total	µg/L	ND 2.7	ND 10	ND 25	ND 2.5	ND 0.27	ND 0.27	ND 0.27	ND 1.1	ND 50	ND 100	ND 200	ND 54	ND 14 H
SM 5310C - TOTAL ORGANIC CARBON														
Total Organic Carbon	mg/L	4.2	1.3	97	110	71	4.1	2.9	2.6	ND 1	110	43	33	2.5
SM 4500S2-D - SULFIDE														
Sulfide	mg/L	ND 0.022	ND 0.1	0.1	ND 0.05 H	0.32	ND 0.022	0.063	0.12	ND 0.1	0.96	3.6	5.6	5.2
SM 2320B - ALKALINITY														
Bicarbonate Alkalinity	mg/L	860	410	970	830	850	650	600	550	380	380	400	370	380
Carbonate Hydroxide	mg/L	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5
Hydroxide Alkalinity	mg/L	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5
Total Alkalinity	mg/L	860	410	970	830	850	650	600	550	380	380	400	370	380
EPA 300.0 - NITRATE AND SULFATE														
Nitrate	mg/L	ND 0.5	ND 1.3	ND 1.3	ND 1.3	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.25 ,H	ND 0.25	ND 0.25	ND 0.88	ND 0.1
Sulfate	mg/L	31	160	ND 5	ND 5	ND 1.8	54	44	85	110	4.3	39	61	77
EPA 200.7 - ARSENIC AND MANGANESE														
Arsenic	µg/L	ND 19 H	--	--	23	19	17	15	19 J,H	--	--	21	20	12 J
Manganese	µg/L	500 H	--	--	5400	3900	2300	2900	2600 H	--	--	3300	2400	870
AM20GAX - HYDROGEN														
Hydrogen	nM	1.4 J	1.6 J	3.9	8.2	2.8	4.0	1.0 J	1.0 J	1.8 J	120	21	2.6	4.0
AM23G - VOLATILE FATTY ACIDS														
4-Methylpentanoic Acid	mg/L	ND 0.56	ND 0.056	--	ND 0.056	ND 0.56	ND 0.056	ND 0.56	ND 0.56	ND 0.056	--	ND 0.056	ND 0.56	ND 0.056
Acetic Acid	mg/L	3.2 J	0.36 J	150	200	120	0.17 J	5.8	1.6 J	0.34 J	160	78	53	2.9
Butyric Acid	mg/L	ND 0.58	ND 0.058	2	7.8	2.4 J	ND 0.058	ND 0.58	ND 0.58	ND 0.058	6.5	2.4	1.9 J	0.13 J
Formic Acid	mg/L	55	5	1.4	1.2	49	5.3	52	47	5	0.84	0.57	48	5.6
i-Hexanoic Acid	mg/L	0.65 J	ND 0.058	ND 0.056	0.45 J	ND 0.58	ND 0.058	ND 0.58	ND 0.58	ND 0.058	ND 0.056	0.085 J	ND 0.58	ND 0.058
Isopentanoic Acid	mg/L	ND 0.61	ND 0.061	0.45 J	0.79	ND 0.61	ND 0.061	ND 0.61	ND 0.61	ND 0.061	0.36 J	0.13 J	ND 0.61	ND 0.061
Lactic Acid	mg/L	37	ND 0.053	ND 1.1	ND 5.3	ND 0.53	ND 0.053	ND 0.53	13	ND 0.053	2.3	ND 0.053	ND 0.53	ND 0.053
Pentanoic Acid	mg/L	ND 0.56	ND 0.056	0.65	0.68	ND 0.56	ND 0.056	ND 0.56	ND 0.56	ND 0.056	0.93	0.058 J	ND 0.56	ND 0.056
Propionic Acid	mg/L	ND 0.53	ND 0.053	29	5.3	4.1 J	ND 0.053	0.64 J	ND 0.53	ND 0.053	14	2.2	1.4 J	ND 0.053
Pyruvic Acid	mg/L	ND 0.6	ND 0.06	0.46 J	0.93	ND 0.6	ND 0.06	ND 0.6	ND 0.6	ND 0.06	0.37 J	0.15 J	ND 0.6	ND 0.06
RSK175 - DISSOLVED GASES														
Carbon Dioxide	mg/L	219	28.7	145	14.1	105	90.4	178	140	22.6	45	2.81	28.9	22.9
Ethane	mg/L	ND 0.00017	0.00012 J	0.0011	0.0028	0.0022	0.0012	0.0017	0.0034	0.0071	0.0064	0.0082	0.0057	ND 0.00017
Ethene	mg/L	0.19	ND 0.00012	0.038	0.95	0.45	0.29	0.47	0.67	0.22	0.15	0.14	0.1	0.11
Methane	mg/L	8.4	0.0035 J	0.37	7.3	9.7	8	9	12	1.3	1.1	0.5	0.26	0.19
QuantArray-Chlor - MICROBIAL														
APS	Cells/mL	63700	1190	---	---	8890000	---	1080000	358000	13400	---	---	342000	---
BVC	Cells/mL	<0.5	< 0.5	---	---	838	---	<0.5	<0.5	< 0.5	---	---	0.4 J	---
CER	Cells/mL	39.8	< 4.6	---	---	795	---	8.9	118	< 4.7	---	---	<4.6	---
CFR	Cells/mL	<4.8	< 4.6	---	---	74.4	---	<4.5	<4.7	< 4.7	---	---	<4.6	---
DCA	Cells/mL	<4.8	< 4.6	---	---	69.4	---	<4.5	<4.7	< 4.7	---	---	<4.6	---
DCAR	Cells/mL	<4.8	< 4.6	---	---	65000	---	<4.5	<4.7	< 4.7	---	---	<4.6	---
DCM	Cells/mL	<4.8	< 4.6	---	---	6320	---	1850	<4.7	< 4.7	---	---	1470	---
DCMA	Cells/mL	<4.8	< 4.6	---	---	6240	---	<4.5	<4.7	< 4.7	---	---	<4.6	---
DECO	Cells/mL	36300	566	---	---	52.8	---	18100	3480	430	---	---	20700	---
DHBt	Cells/mL	21600	< 4.6	---	---	4520	---	82400	12800	771	---	---	60300	---
DHC	Cells/mL	10000	4.4	---	---	4500	---	6230	16600	338	---	---	17200	---
DHG	Cells/mL	14400	679	---	---	29800	---	7940	8580	< 4.7	---	---	<4.6	---
DSB	Cells/mL	16000	< 4.6	---	---	24800	---	89300	13500	< 4.7	---	---	2010	---
DSM	Cells/mL	<4.8	< 4.6	---	---	22700	---	64.2	4.8	222	---	---	18200	---
EBAC	Cells/mL	2210000	393000	---	---	226	---	7860000	2430000	658000	---	---	11800000	---
EtnC	Cells/mL	<4.8	108	---	---	21500	---	174	18.2	26.8	---	---	<4.6	---
EtnE	Cells/mL	134	277	---	---	128000	---	387	50.3	95.8	---	---	<4.6	---
MGN	Cells/mL	5730	< 4.6	---	---	11400	---	46500	10800	0.2 J	---	---	25.5	---
PCE-1	Cells/mL	<4.8	< 4.6	---	---	102	---	<4.5	<4.7	< 4.7	---	---	<4.6	---
PCE-2	Cells/mL	1420	< 4.6	---	---	<6.6	---	<4.5	<4.7	1110	---	---	37900	---
PHE	Cells/mL	29.1	282	---	---	<6.6	---	2250	41.4	3.5 J	---	---	26400	---
RDEG	Cells/mL	<4.8	495	---	---	<6.6	---	1120	298	< 4.7	---	---	185000	---
RMO	Cells/mL	<4.8	603	---	---	<6.6	---	<4.5	<4.7	< 4.7	---	---	<4.6	---
SMMO	Cells/mL	<4.8	< 4.6	---	---	<6.6	---	6700	891	< 4.7	---	---	474	---
TCBO	Cells/mL	<4.8	< 4.6	---	---	<6.6	---	<4.5	<4.7	47	---	---	<4.6	---
TCE	Cells/mL	1020	< 0.5	---	---	<6.6	---	1100	2670	113	---	---	2740	---
TDR	Cells/mL	<4.8	< 4.6	---	---	<6.6	---	<4.5	<4.7	< 4.7	---	---	<4.6	---
TOD	Cells/mL	62	< 4.6	---	---	<6.6	---	<4.5	<4.7	9	---	---	483	---
VCR	Cells/mL	913	< 0.5	---	---	<0.7	---	591	1850	10.1	---	---	18.4	---

For definitions and abbreviations please refer to the notes on page 12.

ED_013761_00000157-00155

TABLE 6
GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID		S146A	S146A	S158A	S158A	S158A	S158A	S158A	S158A	S158A	S159A	S159A	S159A	S159A
Sample Date		8/19/21	11/10/21	9/14/20	12/17/21	1/20/21	2/17/21	5/19/21	8/18/21	11/9/21	9/15/20	12/15/20	1/19/21	1/19/21
Sample Purpose		REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	FD
Analysis Type		INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT
Parameter	Result Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 8260B - VOLATILE ORGANIC COMPOUNDS														
1,1,1,2-Tetrachloroethane	µg/L	ND 10	ND 25	ND 1	ND 250	ND 500	ND 50	ND 2 H	ND 0.2	ND 10 *+	ND 5	ND 5	ND 10	ND 10
1,1,1-Trichloroethane (TCA)	µg/L	4600	6100	ND 1	ND 250	ND 500	ND 50	350 H	79	860	ND 5	ND 5	ND 10	ND 10
1,1,2,2-Tetrachloroethane	µg/L	ND 10	ND 25	ND 1	ND 250	ND 500	ND 55	ND 2 H	ND 0.2	ND 10	ND 5	ND 5	ND 10	ND 10
1,1,2-Trichloroethane	µg/L	ND 11	ND 28	ND 1	ND 250	ND 500	ND 60	ND 2.2 H	ND 0.22	ND 11	ND 5	ND 5	ND 10	ND 10
1,1,2-Trichlorotrifluoroethane (CFC 113)	µg/L	ND 12	ND 30	1500	2900	1100	690	ND 2.4 H	ND 0.24	ND 12	6.9	6.8	ND 10	ND 10
1,1-Dichloroethane (1,1-DCA)	µg/L	69	93 J	33	ND 250	ND 500	50 J	35 H	17	31 J	5.7	ND 5	ND 10	ND 10
1,1-Dichloroethene (1,1-DCE)	µg/L	110	140	19	ND 250	ND 500	ND 65	ND 2.6 H	ND 0.26	ND 13	ND 5	ND 5	ND 10	ND 10
1,1-Dichloropropene	µg/L	ND 12	ND 30	ND 1	ND 250	ND 500	ND 60	ND 2.4 H	ND 0.24	ND 12	ND 5	ND 5	ND 10	ND 10
1,2,3-Trichlorobenzene	µg/L	ND 40	ND 100	ND 2	ND 500	ND 1000	ND 200	ND 8 H	ND 0.8	ND 40	ND 10	ND 10	ND 20	ND 20
1,2,3-Trichloropropane	µg/L	ND 13	ND 33	ND 2	ND 500	ND 1000	ND 65	ND 2.6 H	ND 0.26	ND 13	ND 10	ND 10	ND 20	ND 20
1,2,4-Trichlorobenzene	µg/L	ND 25	ND 63	ND 2	ND 500	ND 1000	ND 130	ND 5 H	ND 0.5	ND 25	ND 10	ND 10	ND 20	ND 20
1,2,4-Trimethylbenzene	µg/L	ND 32	ND 80	ND 2	ND 500	ND 1000	ND 160	ND 6.4 H	ND 0.64	ND 32	ND 10	ND 10	ND 20	ND 20
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	ND 20	ND 50	ND 2	ND 500	ND 1000 *+	ND 100	ND 4 H	ND 0.4	ND 20	ND 10	ND 10	ND 20	ND 20
1,2-Dibromoethane (EDB)	µg/L	ND 12	ND 30	ND 1	ND 250	ND 500	ND 60	ND 2.4 H	ND 0.24	ND 12	ND 5	ND 5	ND 10	ND 10
1,2-Dichlorobenzene	µg/L	59	87 J	24	ND 250	ND 500	ND 49	11 H	6.4	13 J	ND 5	ND 5	ND 10	ND 10
1,2-Dichloroethane	µg/L	ND 14	ND 35	ND 1	ND 250	ND 500	ND 70	ND 2.8 H	ND 0.28	ND 14	ND 5	ND 5	ND 10	ND 10
1,2-Dichloropropane	µg/L	ND 15	ND 38	ND 1	ND 250	ND 500	ND 75	ND 3 H	ND 0.3	ND 15	ND 5	ND 5	ND 10	ND 10
1,3,5-Trimethylbenzene	µg/L	ND 16	ND 40	ND 1	ND 250	ND 500	ND 80	ND 3.2 H	ND 0.32	ND 16	ND 5	ND 5	ND 10	ND 10
1,3-Dichlorobenzene	µg/L	ND 8.6	ND 22	ND 1	ND 250	ND 500	ND 43	ND 1.7 H	ND 0.17	ND 8.6	ND 5	ND 5	ND 10	ND 10
1,3-Dichloropropane	µg/L	ND 10	ND 25	ND 2	ND 500	ND 1000	ND 50	ND 2 H	ND 0.2	ND 10	ND 10	ND 10	ND 20	ND 20
1,4-Dichlorobenzene	µg/L	ND 8.3	ND 21	1.2	ND 250	ND 500	ND 42	ND 1.7 H	ND 0.17	ND 8.3	ND 5	ND 5	ND 10	ND 10
2,2-Dichloropropane	µg/L	ND 46	ND 120	ND 2	ND 500	ND 1000	ND 230	ND 9.2 H	ND 0.92	ND 46	ND 10	ND 10	ND 20	ND 20
2-Butanone (MEK)	µg/L	ND 33	ND 83	ND 4	ND 1000	ND 2000	ND 170	11 J,H	4.8	ND 33	ND 20	31	ND 40	ND 40
2-Chlorotoluene	µg/L	ND 11	ND 28	ND 1	ND 250	ND 500	ND 55	ND 2.2 H	ND 0.22	ND 11	ND 5	ND 5	ND 10	ND 10
2-Hexanone	µg/L	ND 17	ND 43	ND 4	ND 1000	ND 2000	ND 85	ND 3.4 H	ND 0.34	ND 17	ND 20	ND 20	ND 40	ND 40
4-Chlorotoluene	µg/L	ND 10	ND 25	ND 1	ND 250	ND 500	ND 50	ND 2 H	ND 0.2	ND 10	ND 5	ND 5	ND 10	ND 10
4-Isopropyltoluene	µg/L	ND 15	ND 38	ND 2	ND 500	ND 1000	ND 75	ND 3 H	ND 0.3	ND 15	ND 10	ND 10	ND 20	ND 20
Acetone	µg/L	ND 380	ND 950	44	ND 5000	ND 10000	ND 1900	ND 76 H	25	ND 380	ND 100	ND 100	ND 200	ND 200
Benzene	µg/L	ND 8	ND 20	ND 1	ND 250	ND 500	ND 40	ND 1.6 H	ND 0.16	ND 8	ND 5	ND 5	ND 10	ND 10
Bromobenzene	µg/L	ND 9.1	ND 23	ND 2	ND 500	ND 1000	ND 46	ND 1.8 H	ND 0.18	ND 9.1	ND 10	ND 10	ND 20	ND 20
Bromochloromethane	µg/L	ND 18	ND 45	ND 2	ND 500	ND 1000	ND 90	ND 3.6 H	ND 0.36	ND 18	ND 10	ND 10	ND 20	ND 20
Bromodichloromethane	µg/L	ND 14	ND 35	ND 1	ND 250	ND 500	ND 70	ND 2.8 H	ND 0.28	ND 14	ND 5	ND 5	ND 10	ND 10
Bromoform	µg/L	ND 19	ND 48	ND 2	ND 500	ND 1000	ND 95	ND 3.8 H	ND 0.38	ND 19 *+	ND 10	ND 10	ND 20	ND 20
Bromomethane	µg/L	ND 21	ND 53	ND 2	ND 500	ND 1000	ND 110	ND 4.2 H	ND 0.42	ND 21	ND 10	ND 10	ND 20	ND 20
Carbon Disulfide	µg/L	ND 36	ND 90	ND 4	ND 1000	ND 2000	ND 180	ND 7.2 H	ND 0.72	ND 36	ND 20	ND 20	ND 40	ND 40
Carbon Tetrachloride	µg/L	ND 12	ND 30	ND 1	ND 250	ND 500	ND 60	ND 2.4 H	ND 0.24	ND 12 *+	ND 5	ND 5	ND 10	ND 10
Chlorobenzene	µg/L	ND 7	ND 18	ND 1	ND 250	ND 500	ND 35	ND 1.4 H	ND 0.14	ND 7	ND 5	ND 5	ND 10	ND 10
Chloroethane	µg/L	ND 24	ND 60	ND 2	ND 500	ND 1000	ND 120	ND 4.8 H	ND 0.48	ND 24	ND 10	ND 10	ND 20	ND 20
Chloroform	µg/L	ND 12	ND 30	ND 2	ND 500	ND 1000	ND 60	ND 2.4 H	ND 0.24	ND 12	ND 10	ND 10	ND 20	ND 20
Chloromethane	µg/L	ND 26	ND 65	ND 2	ND 500	ND 1000	ND 130	ND 5.2 H	ND 0.52	ND 26	ND 10	ND 10	ND 20	ND 20
cis-1,2-Dichloroethene	µg/L	5900	12000	5700	22000	22000	21000	650 H	44	1200	580	620	480	550
cis-1,3-Dichloropropene	µg/L	ND 15	ND 38	ND 1	ND 250	ND 500	ND 75	ND 3 H	ND 0.3	ND 15	ND 5	ND 5	ND 10	ND 10
Dibromochloromethane	µg/L	ND 16	ND 40	ND 1	ND 250	ND 500	ND 80	ND 3.2 H	ND 0.32	ND 16	ND 5	ND 5	ND 10	ND 10
Dibromomethane	µg/L	ND 17	ND 43	ND 1	ND 250	ND 500	ND 85	ND 3.4 H	ND 0.34	ND 17	ND 5	ND 5	ND 10	ND 10
Dichlorodifluoromethane (CFC 12)	µg/L	ND 32	ND 80	300	ND 500	ND 1000	430 J	100 H	3.2	69 J	ND 10	ND 10	ND 20	ND 20
Ethylbenzene	µg/L	ND 8.4	ND 21	ND 1	ND 250	ND 500	ND 42	ND 1.7 H	0.25 J	ND 8.4	ND 5	ND 5	ND 10	ND 10
Hexachlorobutadiene	µg/L	ND 23	ND 58	ND 2 ,*	ND 500	ND 1000	ND 120	ND 4.6 H	ND 0.46	ND 23 *+	ND 10	ND 10	ND 20	ND 20
Isopropylbenzene	µg/L	ND 11	ND 28	ND 1	ND 250	ND 500	ND 55	ND 2.2 H	ND 0.22	ND 11	ND 5	ND 5	ND 10	ND 10
Methyl Isobutyl Ketone	µg/L	ND 11	ND 28	ND 4	ND 1000	ND 2000	ND 55	ND 2.2 H	ND 0.22	ND 11	ND 20	ND 20	ND 40	ND 40
Methylene Chloride	µg/L	ND 16	ND 40	ND 2	ND 500	ND 1000	ND 80	ND 3.2 H	ND 0.32	ND 16	ND 10	ND 10	ND 20	ND 20
MTBE	µg/L	ND 12	ND 30	ND 1	ND 250	ND 500	ND 60	ND 2.4 H	ND 0.24	ND 12	ND 5	ND 5	ND 10	ND 10
Naphthalene	µg/L	ND 48	ND 120	ND 2	ND 500	ND 1000	ND 240	ND 9.6 H	ND 0.96	ND 48	ND 10	ND 10	ND 20	ND 20
n-Butylbenzene	µg/L	ND 18	ND 45	ND 2	ND 500	ND 1000	ND 90	ND 3.6 H	ND 0.36	ND 18	ND 10	ND 10	ND 20	ND 20
n-Propylbenzene	µg/L	ND 11	ND 28	ND 2	ND 500	ND 1000	ND 55	ND 2.2 H	ND 0.22	ND 11	ND 10	ND 10	ND 20	ND 20
sec-Butylbenzene	µg/L	ND 14	ND 35	ND 2	ND 500	ND 1000	ND 70	ND 2.8 H	ND 0.28	ND 14	ND 10	ND 10	ND 20	ND 20
Styrene	µg/L	ND 13	ND 33	ND 1	ND 250	ND 500	ND 65	ND 2.6 H	ND 0.26	ND 13	ND 5	ND 5	ND 10	ND 10
tert-Butylbenzene	µg/L	ND 13	ND 33	ND 2	ND 500	ND 1000	ND 65	ND 2.6 H	ND 0.26	ND 13	ND 10	ND 10	ND 20	ND 20
Tetrachloroethene (PCE)	µg/L	38 J	43 J	17	ND 250	ND 500	ND 50	ND 2 H	0.3 J	ND 10	ND 5	ND 5	ND 10	ND 10
Toluene	µg/L	ND 9.5	ND 24	1.5	ND 250	ND 500	ND 48	ND 1.9 H	0.51 J	ND 9.5	ND 5	ND 5	ND 10	ND 10
trans-1,2-Dichloroethene	µg/L	18 J	ND 28	27	ND 250	ND 500	ND 55	16 H	12	ND 11	5.3	6.6	ND 10	ND 10
trans-1,3-Dichloropropene	µg/L	ND 16	ND 40	ND 1	ND 250	ND 500	ND 80	ND 3.2 H	ND 0.32	ND 16	ND 5	ND 5	ND 10	ND 10
Trichloroethene (TCE)	µg/L	5000	4100	8100 E	2600	ND 500	ND 50	19 H	1.6	ND 10	140	40	ND 10	ND 10
Trichlorofluoromethane (CFC 11)	µg/L	ND 13	ND 33	ND 2	ND 500	ND 1000	ND 65	ND 2.6 H	ND 0.26	ND 13	ND 10	ND 10	ND 20	ND 20
Vinyl Acetate	µg/L	ND 19	ND 48	ND 4	ND 1000	ND 2000	ND 95	ND 3.8 H	ND 0.38	ND 19	ND 20	ND 20	ND 40	ND 40
Vinyl Chloride	µg/L	49 J	75 J	24	ND 250	ND 500	310	4100 H	130	5100	5.3	37	50	57
Xylenes, Total	µg/L	ND 27	ND 68	1.4	ND 250	ND 500	ND 140	ND 5.4 H	0.58 J	ND 27	ND 5	ND 5	ND 10	ND 10
SM 5310C - TOTAL ORGANIC CARBON														
Total Organic Carbon	mg/L	1.2	0.86 J	2.4	120	130	130	150	210	130	1.8	410	510	--
SM 4500S2 -D - SULFIDE														
Sulfide	mg/L	0.21	0.17	ND 0.1	0.26	0.059	0.21	ND 0.022	0.089	0.38	ND 0.1	ND 0.05	ND 0.05 H,F1,F2	--
Bicarbonate Alkalinity	mg/L	400	360	410	710	810	940	1300	1200	1200	430	1100	1200	--
Carbonate Hydroxide	mg/L	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	--
Hydroxide Alkalinity	mg/L	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	--
Total Alkalinity	mg/L	400	360	410	710	810	940	1300	1200	1200	430	1100	1200	--
EPA 300.0 - NITRATE AND SULFATE														
Nitrate	mg/L	ND 0.5	ND 0.5	ND 1.3	ND 1.3	ND 1.3	ND 0.024	ND 0.5	ND 0.5	ND 0.5	ND 1.3	ND 1.3	ND 1.3	--
Sulfate	mg/L	110	110	180	40	34	2.3	3.5 J	ND 1.8	1.9 J	180	6.8	ND 5	--
EPA 200.7 - ARSENIC AND MANGANESE														
Arsenic	µg/L	ND 4.4	ND 19 H	--	--	26	26	9.2 J	11 J	ND 19 H	--	--	38	--
Manganese	µg/L	560	850 H	--	--	4600	5700	11000	14000 B	6100 H	--	--	4900	--
AM20GAX - HYDROGEN														
Hydrogen	nM	0.86 J	1.4 J	53	64	18	9.6	14	5.0	5.2	2.0	0.83 J	2.1 J	--
AM23G - VOLATILE FATTY ACIDS														
4-Methylpentanoic Acid	mg/L	ND 0.056	ND 0.56	ND 0.056	--	ND 0.056	ND 0.56	ND 0.56	ND 0.56	ND 0.56	ND 0.56	--	ND 0.56	--
Acetic Acid	mg/L	0.79	2.2 J	0.74	210	250	230	350	570	210	3.6 J	350	680	--
Butyric Acid	mg/L	ND 0.058	ND 0.58	ND 0.058	9.1	9	6.8	16	28	ND 0.58	0.88 J	5.6	23	--
Formic Acid	mg/L	4.3	48	4.7	2.1 J	1.1	49	56	47	46	53	5.4	5.6	--
i-Hexanoic Acid	mg/L	ND 0.058	0.67 J	0.075 J	ND 0.28	1.4	ND 0.58	2.1 J	0.9 J	ND 0.58	ND 0.58	ND 0.56	0.96 J	--
Isopentanoic Acid	mg/L	ND 0.061	ND 0.61	ND 0.061	0.36 J	0.45 J	ND 0.61	0.65 J	0.9 J	ND 0.61	ND 0.61	1.3 J	2.9 J	--
Lactic Acid	mg/L	ND 0.053	0.75 J	ND 0.053	ND 0.26	ND 0.053	ND 0.53	ND 0.53	ND 0.53	31	ND 0.53	ND 0.53	1.8 J	--
Pentanoic Acid	mg/L	ND 0.056	ND 0.56	ND 0.056	1.4 J	0.23 J	ND 0.56	ND 0.56	ND 0.56	ND 0.56	ND 0.56	6.8	11	--
Propionic Acid	mg/L	ND 0.053	ND 0.53	0.11 J	13	3.9 J	6.8	6.1	12	ND 0.53	0.61 J	340	200	--
Pyruvic Acid	mg/L	ND 0.06	ND 0.6	ND 0.06	0.54 J	0.61	ND 0.6	ND 0.6	ND 0.6	ND 0.6	ND 0.6	2.6 J	5.8	--
RSK175 - DISSOLVED GASES														
Carbon Dioxide	mg/L	20.9	28.8	24.8	110	11.5	136	211	338	399	25.8	284	347	--
Ethane	mg/L	0.0062	0.0094	0.003	0.0058	0.0067	0.0065	ND 0.00017	0.0065	0.018	0.00033 J	0.00069 J	0.0028	--
Ethene	mg/L	0.12	0.18	0.0013	0.027	0.031	0.27	3.4	2	5.2	0.0024	0.0058	0.033	--
Methane	mg/L	0.25	0.42	0.015	0.015	0.036	0.46	3.3	6.1	3.7	0.2	0.19	3.4	--
QuantArray-Chlor - MICROBIAL														
APS	Cells/mL	537000	221000	386	---	---	1770000	---	149000	401000	17700	---	---	---
BVC	Cells/mL	<0.5	<0.5	< 0.5	---	---	<0.5	---	<0.5	<0.5	< 0.5	---	---	---
CER	Cells/mL	<4.6	<4.9	< 4.6	---	---	<4.7	---	10.3	63.7	< 4.6	---	---	---
CFR	Cells/mL	<4.6	<4.9	< 4.6	---	---	27.5	---	<4.6	<4.7	< 4.6	---	---	---
DCA	Cells/mL	<4.6	<4.9	< 4.6	---	---	4.6 J	---	<4.6	<4.7	< 4.6	---	---	---
DCAR	Cells/mL	<4.6	<4.9	< 4.6	---	---	<4.7	---	<4.6	<4.7	< 4.6	---	---	---
DCM	Cells/mL	90.6	<4.9	< 4.6	---	---	7220	---	633	<4.7	< 4.6	---	---	---
DCMA	Cells/mL	<4.6	<4.9	< 4.6	---	---	<4.7	---	<4.6	<4.7	< 4.6	---	---	---
DECO	Cells/mL	24700	20200	182	---	---	44500	---	5120	12000	425	---	---	---
DHBt	Cells/mL	19200	10100	1180	---	---	427000	---	44900	146000	2630	---	---	---
DHC	Cells/mL	73500	15800	2.2	---	---	20000	---	572000	510000	1.4	---	---	---
DHG	Cells/mL	<4.6	<4.9	< 4.6	---	---	<4.7	---	16.4	3080	< 4.6	---	---	---
DSB	Cells/mL	3750	10700	1580	---	---	307000	---	52500	60500	3230	---	---	---
DSM	Cells/mL	156000	44400	29.9	---	---	203000	---	7370	<4.7	< 4.6	---	---	---
EBAC	Cells/mL	12000000	3260000	171000	---	---	49200000	---	4690000	3720000	1320000	---	---	---
EtnC	Cells/mL	36.7	45.9	< 4.6	---	---	<4.7	---	25.7	24.5	< 4.6	---	---	---
EtnE	Cells/mL	55.6	<4.9	< 4.6	---	---	134	---	278	946	< 4.6	---	---	---
MGN	Cells/mL	237	97.1	< 4.6	---	---	2990	---	111000	76500	< 4.6	---	---	---
PCE-1	Cells/mL	<4.6	<4.9	< 4.6	---	---	9270	---	104	<4.7	< 4.6	---	---	---
PCE-2	Cells/mL	67400	68900	< 4.6	---	---	1990	---	740	4010	< 4.6	---	---	---
PHE	Cells/mL	4420	3070	445	---	---	23200	---	1730	5990	465	---	---	---
RDEG	Cells/mL	9590	11800	< 4.6	---	---	27400	---	3740	15400	206	---	---	---
RMO	Cells/mL	<4.6	<4.9	< 4.6	---	---	105000	---	1400	16800	< 4.6	---	---	---
SMMO	Cells/mL	4090	418	< 4.6	---	---	318	---	<4.6	<4.7	< 4.6	---	---	---
TCBO	Cells/mL	<4.6	<4.9	< 4.6	---	---	<4.7	---	<4.6	<4.7	< 4.6	---	---	---
TCE	Cells/mL	11900	4490	< 0.5	---	---	3160	---	108000	245000	< 0.5	---	---	---
TDR	Cells/mL	<4.6	<4.9	< 4.6	---	---	<4.7	---	<4.6	<4.7	< 4.6	---	---	---
TOD	Cells/mL	890	3320	< 4.6	---	---	<4.7	---	<4.6	544	< 4.6	---	---	---
VCR	Cells/mL	8.3	20.7	< 0.5	---	---	1430	---	46700	34300	< 0.5	---	---	---

For definitions and abbreviations please refer to the notes on page 12.

ED_013761_00000157-00156

TABLE 6
GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID		S159A	S159A	S159A	S159A	S160A	S160A	S160A	S160A	S160A	S160A	S160A	S160A	S160A
Sample Date		2/15/21	5/17/21	8/17/21	11/8/21	9/15/20	12/16/20	1/19/21	2/16/21	5/18/21	5/18/21	5/18/21	5/18/21	8/18/21
Sample Purpose		REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	FD	FD	REG
Analysis Type		INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	REANL	INIT	REANL	INIT
Parameter	Result Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 8260B - VOLATILE ORGANIC COMPOUNDS														
1,1,1,2-Tetrachloroethane	µg/L	ND 0.4	ND 0.1	ND 0.1	ND 0.1	ND 25	ND 10	ND 25	ND 2	ND 2	ND 1 H	ND 2	ND 1 H	ND 2
1,1,1-Trichloroethane (TCA)	µg/L	ND 0.4	ND 0.17	ND 0.17	ND 0.17	ND 25	ND 10	ND 25	ND 2	4.9 J	4.5 J,H	3.7 J	3.8 J,H	ND 3.4
1,1,2,2-Tetrachloroethane	µg/L	ND 0.44	ND 0.1	ND 0.1	ND 0.1	ND 25	ND 10	ND 25	ND 2.2	ND 2	1.3 J,H	ND 2	1.1 J,H	ND 2
1,1,2-Trichloroethane	µg/L	ND 0.48	ND 0.11	ND 0.11	ND 0.11	ND 25	ND 10	ND 25	ND 2.4	ND 2.2	ND 1.1 H	ND 2.2	ND 1.1 H	ND 2.2
1,1,2-Trichlorotrifluoroethane (CFC 113)	µg/L	ND 0.68	ND 0.12	ND 0.12	ND 0.12	ND 25	ND 10	ND 25	4.3 J	ND 2.4	ND 1.2 H	ND 2.4	ND 1.2 H	ND 2.4
1,1-Dichloroethane (1,1-DCA)	µg/L	3.7	ND 0.1	ND 0.1	ND 0.1	120	11	ND 25	6.3 J	6.9 J	6.4 H	5.6 J	5.8 H	4.7 J
1,1-Dichloroethene (1,1-DCE)	µg/L	ND 0.52	ND 0.13	ND 0.13	ND 0.13	ND 25	ND 10	ND 25	ND 2.6	ND 2.6	2.3 J,H	ND 2.6	2 J,H	ND 2.6
1,1-Dichloropropene	µg/L	ND 0.48	ND 0.12	ND 0.12	ND 0.12	ND 25	ND 10	ND 25	ND 2.4	ND 2.4	ND 1.2 H	ND 2.4	ND 1.2 H	ND 2.4
1,2,3-Trichlorobenzene	µg/L	ND 1.6	ND 0.4	ND 0.4	ND 0.4	ND 50	ND 20	ND 50	ND 8	ND 8	ND 4 H	ND 8	ND 4 H	ND 8
1,2,3-Trichloropropane	µg/L	ND 0.52	ND 0.13	ND 0.13	ND 0.13	ND 50	ND 20	ND 50	ND 2.6	ND 2.6	ND 1.3 H	ND 2.6	ND 1.3 H	ND 2.6
1,2,4-Trichlorobenzene	µg/L	ND 1	ND 0.25	ND 0.25	ND 0.25 *+	ND 50	ND 20	ND 50	ND 5	ND 5	ND 2.5 H	ND 5	ND 2.5 H	ND 5
1,2,4-Trimethylbenzene	µg/L	ND 1.3	ND 0.32	ND 0.32	ND 0.32	ND 50	ND 20	ND 50	ND 6.4	ND 6.4	ND 3.2 H	ND 6.4	ND 3.2 H	ND 6.4
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	ND 0.8	ND 0.2	ND 0.2	ND 0.2	ND 50	ND 20	ND 50	ND 4	ND 4	ND 2 H	ND 4	ND 2 H	ND 4
1,2-Dibromoethane (EDB)	µg/L	ND 0.48	ND 0.12	ND 0.12	ND 0.12	ND 25	ND 10	ND 25	ND 2.4	ND 2.4	ND 1.2 H	ND 2.4	ND 1.2 H	ND 2.4
1,2-Dichlorobenzene	µg/L	ND 0.39	0.3 J	0.15 J	0.16 J	ND 25	ND 10	ND 25	ND 1.9	ND 1.9	ND 0.97 H	ND 1.9	ND 0.97 H	ND 1.9
1,2-Dichloroethane	µg/L	ND 0.56	ND 0.14	ND 0.14	ND 0.14	ND 25	ND 10	ND 25	ND 2.8	ND 2.8	ND 1.4 H	ND 2.8	ND 1.4 H	ND 2.8
1,2-Dichloropropane	µg/L	ND 0.6	ND 0.15	ND 0.15	ND 0.15	ND 25	ND 10	ND 25	ND 3	ND 3	ND 1.5 H	ND 3	ND 1.5 H	ND 3
1,3,5-Trimethylbenzene	µg/L	ND 0.64	ND 0.16	ND 0.16	ND 0.16	ND 25	ND 10	ND 25	ND 3.2	ND 3.2	ND 1.6 H	ND 3.2	ND 1.6 H	ND 3.2
1,3-Dichlorobenzene	µg/L	ND 0.34	ND 0.086	ND 0.086	ND 0.086	ND 25	ND 10	ND 25	ND 1.7	ND 1.7	ND 0.86 H	ND 1.7	ND 0.86 H	ND 1.7
1,3-Dichloropropane	µg/L	ND 0.4	ND 0.1	ND 0.1	ND 0.1	ND 50	ND 20	ND 50	ND 2	ND 2	ND 1 H	ND 2	ND 1 H	ND 2
1,4-Dichlorobenzene	µg/L	ND 0.33	ND 0.083	ND 0.083	ND 0.083	ND 25	ND 10	ND 25	ND 1.7	ND 1.7	ND 0.83 H	ND 1.7	ND 0.83 H	ND 1.7
2,2-Dichloropropane	µg/L	ND 1.8	ND 0.46	ND 0.46	ND 0.46	ND 50	ND 20	ND 50	ND 9.2	ND 9.2	ND 4.6 H	ND 9.2	ND 4.6 H	ND 9.2
2-Butanone (MEK)	µg/L	31	20	9.7	1.4 J	ND 100	ND 40	ND 100	ND 6.6	ND 6.6	ND 3.3 H	ND 6.6	ND 3.3 H	ND 6.6
2-Chlorotoluene	µg/L	ND 0.44	ND 0.11	ND 0.11	ND 0.11	ND 25	ND 10	ND 25	ND 2.2	ND 2.2	ND 1.1 H	ND 2.2	ND 1.1 H	ND 2.2
2-Hexanone	µg/L	ND 0.68	0.48 J	0.46 J	0.47 J	ND 100	ND 40	ND 100	ND 3.4	ND 3.4	ND 1.7 H	ND 3.4	ND 1.7 H	ND 3.4
4-Chlorotoluene	µg/L	ND 0.4	ND 0.1	ND 0.1	ND 0.1	ND 25	ND 10	ND 25	ND 2	ND 2	ND 1 H	ND 2	ND 1 H	ND 2
4-Isopropyltoluene	µg/L	ND 0.6	ND 0.15	ND 0.15	ND 0.15	ND 50	ND 20	ND 50	ND 3	ND 3	ND 1.5 H	ND 3	ND 1.5 H	ND 3
Acetone	µg/L	18 J	18	11	ND 3.8	ND 500	ND 200	ND 500	ND 76	ND 76	ND 38 H	ND 76	ND 38 H	ND 76
Benzene	µg/L	ND 0.32	ND 0.08	ND 0.08	ND 0.08	ND 25	ND 10	ND 25	ND 1.6	ND 1.6	ND 0.8 H	ND 1.6	ND 0.8 H	ND 1.6
Bromobenzene	µg/L	ND 0.36	ND 0.091	ND 0.091	ND 0.091	ND 50	ND 20	ND 50	ND 1.8	ND 1.8	ND 0.91 H	ND 1.8	ND 0.91 H	ND 1.8
Bromochloromethane	µg/L	ND 0.72	ND 0.18	ND 0.18	ND 0.18	ND 50	ND 20	ND 50	ND 3.6	ND 3.6	ND 1.8 H	ND 3.6	ND 1.8 H	ND 3.6
Bromodichloromethane	µg/L	ND 0.56	ND 0.14	ND 0.14	ND 0.14	ND 25	ND 10	ND 25	ND 2.8	ND 2.8	ND 1.4 H	ND 2.8	ND 1.4 H	ND 2.8
Bromoform	µg/L	ND 0.76	ND 0.19	ND 0.19	ND 0.19	ND 50	ND 20	ND 50	ND 3.8 *+	ND 3.8	ND 1.9 H	ND 3.8	ND 1.9 H	ND 3.8
Bromomethane	µg/L	ND 0.84	ND 0.21	ND 0.21	ND 0.21	ND 50	ND 20	ND 50	ND 4.2	ND 4.2	ND 2.1 H	ND 4.2	ND 2.1 H	ND 4.2
Carbon Disulfide	µg/L	ND 1.4	0.66 J	0.57 J	ND 0.36	ND 100	ND 40	ND 100	ND 7.2	ND 7.2	ND 3.6 H	ND 7.2	ND 3.6 H	ND 7.2
Carbon Tetrachloride	µg/L	ND 0.48	ND 0.12	ND 0.12	ND 0.12	ND 25	ND 10	ND 25	ND 2.4	ND 2.4	ND 1.2 H	ND 2.4	ND 1.2 H	ND 2.4
Chlorobenzene	µg/L	ND 0.28	ND 0.07	ND 0.07	ND 0.07	ND 25	ND 10	ND 25	ND 1.4	ND 1.4	ND 0.7 H	ND 1.4	ND 0.7 H	ND 1.4
Chloroethane	µg/L	2.7 J	4.9	3.5	3.6	ND 50	ND 20	ND 50	ND 4.8	16 J	16 H	16 J	13 H	20
Chloroform	µg/L	ND 0.48	ND 0.12	ND 0.12	ND 0.12	ND 50	ND 20	ND 50	ND 2.4	ND 2.4	ND 1.2 H	ND 2.4	ND 1.2 H	ND 2.4
Chloromethane	µg/L	ND 1	ND 0.26	ND 0.26	ND 0.26	ND 50	ND 20	ND 50	ND 5.2	ND 5.2	ND 2.6 H	ND 5.2	ND 2.6 H	ND 5.2
cis-1,2-Dichloroethene	µg/L	210	2.3	1.1	1.5	1600	1300	1400	1100	1200	--	1100	--	680
cis-1,3-Dichloropropene	µg/L	ND 0.6	ND 0.15	ND 0.15	ND 0.15	ND 25	ND 10	ND 25	ND 3	ND 3	ND 1.5 H	ND 3	ND 1.5 H	ND 3
Dibromochloromethane	µg/L	ND 0.64	ND 0.16	ND 0.16	ND 0.16	ND 25	ND 10	ND 25	ND 3.2	ND 3.2	ND 1.6 H	ND 3.2	ND 1.6 H	ND 3.2
Dibromomethane	µg/L	ND 0.68	ND 0.17	ND 0.17	ND 0.17	ND 25	ND 10	ND 25	ND 3.4	ND 3.4	ND 1.7 H	ND 3.4	ND 1.7 H	ND 3.4
Dichlorodifluoromethane (CFC 12)	µg/L	ND 1.3	ND 0.32	ND 0.32	ND 0.32	ND 50	ND 20	ND 50	ND 6.4	ND 6.4	ND 3.2 H	ND 6.4	ND 3.2 H	ND 6.4
Ethylbenzene	µg/L	ND 0.34	ND 0.084	ND 0.084	ND 0.084	ND 25	ND 10	ND 25	ND 1.7	ND 1.7	ND 0.84 H	ND 1.7	ND 0.84 H	ND 1.7
Hexachlorobutadiene	µg/L	ND 0.92	ND 0.23	ND 0.23	ND 0.23 *+	ND 50	ND 20	ND 50	ND 4.6 *+	ND 4.6	ND 2.3 H	ND 4.6	ND 2.3 H	ND 4.6
Isopropylbenzene	µg/L	ND 0.44	ND 0.11	ND 0.11	ND 0.11	ND 25	ND 10	ND 25	ND 2.2	ND 2.2	ND 1.1 H	ND 2.2	ND 1.1 H	ND 2.2
Methyl Isobutyl Ketone	µg/L	ND 0.44	0.26 J	0.21 J	0.11 J	ND 100	ND 40	ND 100	ND 2.2	ND 2.2	ND 1.1 H	ND 2.2	ND 1.1 H	ND 2.2
Methylene Chloride	µg/L	ND 0.64	ND 0.16	ND 0.16	ND 0.16	ND 50	ND 20	ND 50	ND 3.2	ND 3.2	3.5 J,H,B	ND 3.2	3.1 J,H,B	ND 3.2
MTBE	µg/L	ND 0.48	ND 0.12	ND 0.12	ND 0.12	ND 25	ND 10	ND 25	ND 2.4	ND 2.4	ND 1.2 H	ND 2.4	ND 1.2 H	ND 2.4
Naphthalene	µg/L	ND 1.9	ND 0.48	ND 0.48	ND 0.48	ND 50	ND 20	ND 50	ND 9.6	ND 9.6	ND 4.8 H	ND 9.6	ND 4.8 H	ND 9.6
n-Butylbenzene	µg/L	ND 0.72	ND 0.18	ND 0.18	ND 0.18	ND 50	ND 20	ND 50	ND 3.6	ND 3.6	ND 1.8 H	ND 3.6	ND 1.8 H	ND 3.6
n-Propylbenzene	µg/L	ND 0.44	ND 0.11	ND 0.11	ND 0.11	ND 50	ND 20	ND 50	ND 2.2	ND 2.2	ND 1.1 H	ND 2.2	ND 1.1 H	ND 2.2
sec-Butylbenzene	µg/L	ND 0.56	ND 0.14	ND 0.14	ND 0.14	ND 50	ND 20	ND 50	ND 2.8	ND 2.8	ND 1.4 H	ND 2.8	ND 1.4 H	ND 2.8
Styrene	µg/L	ND 0.52	ND 0.13	ND 0.13	ND 0.13	ND 25	ND 10	ND 25	ND 2.6	ND 2.6	ND 1.3 H	ND 2.6	ND 1.3 H	ND 2.6
tert-Butylbenzene	µg/L	ND 0.52	ND 0.13	ND 0.13	ND 0.13	ND 50	ND 20	ND 50	ND 2.6	ND 2.6	ND 1.3 H	ND 2.6	ND 1.3 H	ND 2.6
Tetrachloroethene (PCE)	µg/L	ND 0.4	ND 0.1	ND 0.1	ND 0.1	ND 25	ND 10	ND 25	ND 2	ND 2	ND 1 H	ND 2	ND 1 H	ND 2
Toluene	µg/L	ND 0.38	ND 0.095	ND 0.095	ND 0.095	ND 25	ND 10	ND 25	ND 1.9	ND 1.9	ND 0.95 H	ND 1.9	ND 0.95 H	ND 1.9
trans-1,2-Dichloroethene	µg/L	7.3	6	4	3	ND 25	ND 10	ND 25	2.8 J	8.4 J	8.2 H	6.9 J	7.3 H	6.4 J
trans-1,3-Dichloropropene	µg/L	ND 0.64	ND 0.16	ND 0.16	ND 0.16	ND 25	ND 10	ND 25	ND 3.2	ND 3.2	ND 1.6 H	ND 3.2	ND 1.6 H	ND 3.2
Trichloroethene (TCE)	µg/L	1.6 J	0.52	0.37 J	0.33 J	500	ND 10	ND 25	16	21	20 H	19	18 H	59
Trichlorofluoromethane (CFC 11)	µg/L	ND 0.52	ND 0.13	ND 0.13	ND 0.13	ND 50	ND 20	ND 50	ND 2.6	ND 2.6	ND 1.3 H	ND 2.6	ND 1.3 H	ND 2.6
Vinyl Acetate	µg/L	ND 0.76	ND 0.19	ND 0.19	ND 0.19 *+	ND 100	ND 40	ND 100	ND 3.8	ND 3.8	ND 1.9 H	ND 3.8	ND 1.9 H	ND 3.8
Vinyl Chloride	µg/L	41	0.82	0.62	ND 0.18	300	77	78	69	97	93 H	83	76 H	71
Xylenes, Total	µg/L	ND 1.1	ND 0.27	ND 0.27	ND 0.27	ND 25	ND 10	ND 25	ND 5.4	ND 5.4	ND 2.7 H	ND 5.4	ND 2.7 H	ND 5.4
SM 5310C - TOTAL ORGANIC CARBON														
Total Organic Carbon	mg/L	460	83	54	19	ND 1	6.7	4.2	4.4	4.4	--	4.4	--	3.2
SM 4500S2-D - SULFIDE														
Sulfide	mg/L	0.23	0.056	ND 0.022	ND 0.022	ND 0.1	0.17	ND 0.05 H	0.22	ND 0.022	--	ND 0.022	--	0.15
SM 2320B - ALKALINITY														
Bicarbonate Alkalinity	mg/L	1300	1500	1700	1400	690	730	790	890	1000	--	1000	--	1000
Carbonate Hydroxide	mg/L	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	--	ND 5	--	ND 5
Hydroxide Alkalinity	mg/L	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	--	ND 5	--	ND 5
Total Alkalinity	mg/L	1300	1500	1700	1400	690	730	790	890	1000	--	1000	--	1000
EPA 300.0 - NITRATE AND SULFATE														
Nitrate	mg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 1.3	ND 1.3	ND 1.3	ND 0.88	ND 0.5	--	ND 0.5	--	ND 0.5
Sulfate	mg/L	2 J	ND 1.8	ND 1.8	ND 1.8	110	130	160	160	130	--	130	--	96
EPA 200.7 - ARSENIC AND MANGANESE														
Arsenic	µg/L	25	21	21	21 J,H	--	--	ND 15	16	ND 4.4	--	5.1 J	--	ND 4.4
Manganese	µg/L	5100	4000	3600	4000 H	--	--	1100	1100	990	--	1100	--	1100 B
AM20GAX - HYDROGEN														
Hydrogen	nM	3.6	4.6	3.0	1.9 J	4.6	3.0	1.9 J	4.6	3.0	1.9 J	4.6	3.0	1.9 J
AM23G - VOLATILE FATTY ACIDS														
4-Methylpentanoic Acid	mg/L	ND 0.56	ND 0.11	ND 0.56	ND 0.56	ND 0.56	--	ND 0.056	ND 0.56	ND 0.056	--	--	--	ND 0.56
Acetic Acid	mg/L	500	32	48	14	3.4 J	6.8	1.8	5.7	0.21 J	--	--	--	3.8 J
Butyric Acid	mg/L	44	ND 0.12	ND 0.58	ND 0.58	ND 0.58	ND 0.29	ND 0.058	ND 0.58	ND 0.058	--	--	--	ND 0.58
Formic Acid	mg/L	56	11	42	46	50	2 J	0.29 J	47	5.4	--	--	--	45
i-Hexanoic Acid	mg/L	5.2	ND 0.12	ND 0.58	ND 0.58	ND 0.58	ND 0.28	ND 0.058	ND 0.58	ND 0.058	--	--	--	ND 0.58
Isopentanoic Acid	mg/L	4.3 J	ND 0.12	ND 0.61	ND 0.61	ND 0.61	ND 0.3	ND 0.061	ND 0.61	ND 0.061	--	--	--	ND 0.61
Lactic Acid	mg/L	1.3 J	ND 0.11	ND 0.53	4.9 J	ND 0.53	0.78 J	ND 0.053	ND 0.53	ND 0.053	--	--	--	ND 0.53
Pentanoic Acid	mg/L	12	ND 0.11	ND 0.56	ND 0.56	ND 0.56	ND 0.28	ND 0.056	ND 0.56	ND 0.056	--	--	--	ND 0.56
Propionic Acid	mg/L	180	25	2.8 J	ND 0.53	ND 0.53	ND 0.26	0.13 J	ND 0.53	ND 0.053	--	--	--	ND 0.53
Pyruvic Acid	mg/L	10	ND 0.12	ND 0.6	ND 0.6	ND 0.6	ND 0.3	ND 0.06	ND 0.6	ND 0.06	--	--	--	ND 0.6
RSK175 - DISSOLVED GASES														
Carbon Dioxide	mg/L	285	191	265	167	71.4	75.9	132	123	178	--	--	--	188
Ethane	mg/L	0.0024	ND 0.00017	ND 0.00017	0.00033 J	0.0067	0.00082 J	0.0016	0.0018	ND 0.00017	--	--	--	0.0036
Ethene	mg/L	0.1	0.019	0.012	0.0039	0.85	0.025	0.043	0.072	0.064	--	--	--	0.04
Methane	mg/L	8.5	7.4	6.5	2.9	4	1	2.6	2.2	4.2	--	--	--	6.9
QuantArray-Chlor - MICROBIAL														
APS	Cells/mL	191000	--	14600	6670	292000	--	--	133000	--	--	--	--	56600
BVC	Cells/mL	<0.5	--	<0.9	<0.5	< 0.5	--	--	<0.5	--	--	--	--	<0.5
CER	Cells/mL	<4.7	--	<9.2	20.5	5.2	--	--	271	--	--	--	--	993
CFR	Cells/mL	<4.7	--	<9.2	<5	< 4.6	--	--	<4.7	--	--	--	--	<4.5
DCA	Cells/mL	<4.7	--	<9.2	<5	< 4.6	--	--	<4.7	--	--	--	--	<4.5
DCAR	Cells/mL	<4.7	--	<9.2	<5	< 4.6	--	--	<4.7	--	--	--	--	<4.5
DCM	Cells/mL	1800	--	<9.2	<5	< 4.6	--	--	<4.7	--	--	--	--	<4.5
DCMA	Cells/mL	<4.7	--	<9.2	<5	< 4.6	--	--	<4.7	--	--	--	--	<4.5
DECO	Cells/mL	17200	--	7580	5550	5600	--	--	3580	--	--	--	--	1520
DHBt	Cells/mL	26100	--	2400	16800	27100	--	--	20700	--	--	--	--	8780
DHC	Cells/mL	109000	--	1860	2000	26.8	--	--	10400	--	--	--	--	5980
DHG	Cells/mL	<4.7	--	1450	540	2340	--	--	7720	--	--	--	--	30400
DSB	Cells/mL	13400	--	5520	21800	15400	--	--	19500	--	--	--	--	17300
DSM	Cells/mL	4.8	--	<9.2	9.8	6750	--	--	451	--	--	--	--	<4.5
EBAC	Cells/mL	35200000	--	6650000	2530000	10100000	--	--	5600000	--	--	--	--	3030000
EtnC	Cells/mL	<4.7	--	<9.2	<5	< 4.6	--	--	<4.7	--	--	--	--	<4.5
EtnE	Cells/mL	<4.7	--	<9.2	<5	< 4.6	--	--	116	--	--	--	--	68.6
MGN	Cells/mL	204000	--	222000	172000	2.4 J	--	--	454	--	--	--	--	2920
PCE-1	Cells/mL	<4.7	--	<9.2	<5	< 4.6	--	--	<4.7	--	--	--	--	<4.5
PCE-2	Cells/mL	39.8	--	<9.2	<5	< 4.6	--	--	2140	--	--	--	--	1730
PHE	Cells/mL	44.7	--	310	60.9	634	--	--	6320	--	--	--	--	11.1
RDEG	Cells/mL	<4.7	--	<9.2	331	447	--	--	11600	--	--	--	--	41.3
RMO	Cells/mL	<4.7	--	5.6 J	<5	< 4.6	--	--	27600	--	--	--	--	<4.5
SMMO	Cells/mL	524	--	<9.2	<5	< 4.6	--	--	191	--	--	--	--	<4.5
TCBO	Cells/mL	<4.7	--	<9.2	<5	< 4.6	--	--	<4.7	--	--	--	--	<4.5
TCE	Cells/mL	22600	--	228	406	4.4	--	--	1270	--	--	--	--	785
TDR	Cells/mL	<4.7	--	<9.2	<5	< 4.6	--	--	<4.7	--	--	--	--	<4.5
TOD	Cells/mL	<4.7	--	<9.2	333	< 4.6	--	--	<4.7	--	--	--	--	<4.5
VCR	Cells/mL	13600	--	182	353	4.4	--	--	711	--	--	--	--	428

For definitions and abbreviations please refer to the notes on page 12.

ED_013761_00000157-00157

TABLE 6
GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID		S160A	TW-1	TW-2	TW-3	Blank	Blank	Blank	Blank	Blank	Blank	Blank	Trip Blank	Trip Blank
Sample Date		11/9/21	11/20/20	11/20/20	11/20/20	9/15/20	12/17/20	1/19/21	2/17/21	5/18/21	8/19/21	11/9/21	9/14/20	9/15/20
Sample Purpose		REG	REG	REG	REG	FB	FB	FB	FB	FB	FB	FB	TB	TB
Analysis Type		INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT
Parameter	Result Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 8260B - VOLATILE ORGANIC COMPOUNDS														
1,1,1,2-Tetrachloroethane	µg/L	3.8 J	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.1	ND 0.1	ND 0.1	ND 0.1 *+	ND 0.5	ND 0.5
1,1,1-Trichloroethane (TCA)	µg/L	ND 2	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.1	ND 0.17	ND 0.17	ND 0.17	ND 0.5	ND 0.5
1,1,2,2-Tetrachloroethane	µg/L	ND 2.2	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.11	ND 0.1	ND 0.1	ND 0.1	ND 0.5	ND 0.5
1,1,2-Trichloroethane	µg/L	ND 2.4	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.12	ND 0.11	ND 0.11	ND 0.11	ND 0.5	ND 0.5
1,1,2-Trichlorotrifluoroethane (CFC 113)	µg/L	4.2 J	12	5.9	3.5	ND 0.5	ND 0.50	ND 0.5	ND 0.17	ND 0.12	ND 0.12	ND 0.12	ND 0.5	ND 0.5
1,1-Dichloroethane (1,1-DCA)	µg/L	ND 2.6	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.5	ND 0.5
1,1-Dichloroethene (1,1-DCE)	µg/L	ND 2.4	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.5	ND 0.5
1,1-Dichloropropene	µg/L	ND 8	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.5	ND 0.5
1,2,3-Trichlorobenzene	µg/L	ND 2.6	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.4	ND 0.4	ND 0.4	ND 0.4	ND 1	ND 1
1,2,3-Trichloropropane	µg/L	ND 5	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 1	ND 1
1,2,4-Trichlorobenzene	µg/L	ND 6.4	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.25	ND 0.25	ND 0.25	ND 0.25	ND 1	ND 1
1,2,4-Trimethylbenzene	µg/L	ND 4	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.32	ND 0.32	ND 0.32	ND 0.32	ND 1	ND 1
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	ND 2.4	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.2	ND 0.2	ND 0.2	ND 0.2	ND 1	ND 1
1,2-Dibromoethane (EDB)	µg/L	ND 1.9	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.5	ND 0.5
1,2-Dichlorobenzene	µg/L	ND 2.8	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.097	ND 0.097	ND 0.097	ND 0.097	ND 0.5	ND 0.5
1,2-Dichloroethane	µg/L	ND 3	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.14	ND 0.14	ND 0.14	ND 0.14	ND 0.5	ND 0.5
1,2-Dichloropropane	µg/L	ND 3.2	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.15	ND 0.15	ND 0.15	ND 0.15	ND 0.5	ND 0.5
1,3,5-Trimethylbenzene	µg/L	ND 1.7	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.5	ND 0.5
1,3-Dichlorobenzene	µg/L	ND 2	ND 10	ND 2	ND 1	ND 1	ND 1.0	ND 0.5	ND 0.086	ND 0.086	ND 0.086	ND 0.086	ND 1	ND 1
1,3-Dichloropropane	µg/L	ND 1.7	ND 20	ND 4	ND 2	ND 0.5	ND 0.50	ND 1	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.5	ND 0.5
1,4-Dichlorobenzene	µg/L	ND 9.2	ND 10	ND 2	ND 1	ND 1	ND 1.0	ND 0.5	ND 0.083	ND 0.083	ND 0.083	ND 0.083	ND 1	ND 1
2,2-Dichloropropane	µg/L	ND 6.6	ND 20	ND 4	ND 2	ND 2	ND 2.0	ND 1	ND 0.46	ND 0.46	ND 0.46	ND 0.46	ND 2	ND 2
2-Butanone (MEK)	µg/L	ND 2.2	40	30	ND 4	ND 0.5	ND 0.50	ND 2	ND 0.33	ND 0.33	ND 0.33	ND 0.33	ND 0.5	ND 0.5
2-Chlorotoluene	µg/L	ND 3.4	ND 10	ND 2	ND 1	ND 2	ND 2.0	ND 0.5	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 2	ND 2
2-Hexanone	µg/L	ND 2	ND 40	ND 8	ND 4	ND 0.5	ND 0.50	ND 2	ND 0.17	ND 0.17	ND 0.17	ND 0.17	ND 0.5	ND 0.5
4-Chlorotoluene	µg/L	ND 3	ND 10	ND 2	ND 1	ND 1	ND 1.0	ND 0.5	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 1	ND 1
4-Isopropyltoluene	µg/L	ND 76	ND 20	ND 4	ND 2	ND 2	ND 2.0	ND 1	ND 0.15	ND 0.15	ND 0.15	ND 0.15	ND 2	ND 2
Acetone	µg/L	ND 1.6	ND 200	ND 40	ND 20	ND 10	ND 10	ND 10	ND 3.8	ND 3.8	4.3 J	ND 3.8	ND 10	ND 10
Benzene	µg/L	ND 1.8	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.08	ND 0.08	ND 0.08	ND 0.08	ND 0.5	ND 0.5
Bromobenzene	µg/L	ND 3.6	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.091	ND 0.091	ND 0.091	ND 0.091	ND 1	ND 1
Bromochloromethane	µg/L	ND 2.4 *+	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 1	ND 1
Bromodichloromethane	µg/L	ND 2.8	ND 10	ND 2	ND 1	ND 1	ND 1.0	ND 0.5	ND 0.14	ND 0.14	ND 0.14	ND 0.14	ND 1	ND 1
Bromoform	µg/L	ND 4.2	ND 20	ND 4	ND 2	ND 2	ND 2.0	ND 1	ND 0.19	ND 0.19	ND 0.19	ND 0.19 *+	ND 2	ND 2
Bromomethane	µg/L	ND 7.2	ND 20	ND 4	ND 2	ND 0.5	ND 0.50	ND 1	ND 0.21	ND 0.21	ND 0.21	ND 0.21	ND 0.5	ND 0.5
Carbon Disulfide	µg/L	ND 1.4	ND 40	ND 8	ND 4	ND 0.5	ND 0.50	ND 2	ND 0.36	ND 0.36	ND 0.36	B 0.93 J,B	ND 0.5	ND 0.5
Carbon Tetrachloride	µg/L	25	ND 10	ND 2	ND 1	ND 1	ND 1.0	ND 0.5	ND 0.12	ND 0.12	ND 0.12	ND 0.12 *+	ND 1	ND 1
Chlorobenzene	µg/L	ND 2.4	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.07	ND 0.07	ND 0.07	ND 0.07	ND 0.5	ND 0.5
Chloroethane	µg/L	ND 5.2	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.24	ND 0.24	ND 0.24	ND 0.24	ND 1	ND 1
Chloroform	µg/L	840	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 1	ND 1
Chloromethane	µg/L	ND 3	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.26	ND 0.26	ND 0.26	ND 0.26	ND 1	ND 1
cis-1,2-Dichloroethene	µg/L	ND 3.2	94	100	76	ND 0.5	ND 0.50	ND 0.5	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.5	ND 0.5
cis-1,3-Dichloropropene	µg/L	ND 3.4	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.15	ND 0.15	ND 0.15	ND 0.15	ND 0.5	ND 0.5
Dibromochloromethane	µg/L	ND 6.4	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.5	ND 0.5
Dibromomethane	µg/L	ND 1.7	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.17	ND 0.17	ND 0.17	ND 0.17	ND 0.5	ND 0.5
Dichlorodifluoromethane (CFC 12)	µg/L	ND 2.2	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.32	ND 0.32	ND 0.32	ND 0.32	ND 1	ND 1
Ethylbenzene	µg/L	ND 2 *+	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.084	ND 0.084	ND 0.084	ND 0.084	ND 0.5	ND 0.5
Hexachlorobutadiene	µg/L	ND 2.2	ND 20	ND 4	ND 2	ND 0.5	ND 0.50	ND 1	ND 0.23	ND 0.23	ND 0.23	ND 0.23 *+	ND 0.5	ND 0.5
Isopropylbenzene	µg/L	ND 3.8 *+	ND 10	ND 2	ND 1	ND 1	ND 1.0	ND 0.5	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 1 ,*	ND 1
Methyl Isobutyl Ketone	µg/L	ND 4.6 *+	ND 40	ND 8	ND 4	ND 0.5	ND 0.50	ND 2	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.5	ND 0.5
Methylene Chloride	µg/L	ND 3.2	ND 20	ND 4	ND 2	ND 0.5	ND 0.50	ND 1	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.5	ND 0.5
MTBE	µg/L	ND 2.4	ND 10	ND 2	ND 1	ND 1	ND 1.0	ND 0.5	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 1	ND 1
Naphthalene	µg/L	ND 9.6	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.48	ND 0.48	ND 0.48	ND 0.48	ND 1	ND 1
n-Butylbenzene	µg/L	ND 3.6	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 1	ND 1
n-Propylbenzene	µg/L	ND 2.2	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 1	ND 1
sec-Butylbenzene	µg/L	ND 2.8	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.14	ND 0.14	ND 0.14	ND 0.14	ND 1	ND 1
Styrene	µg/L	ND 2.6	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.5	ND 0.5
tert-Butylbenzene	µg/L	ND 2.6	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 1	ND 1
Tetrachloroethene (PCE)	µg/L	ND 2	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.5	ND 0.5
Toluene	µg/L	ND 1.9	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.095	ND 0.095	ND 0.095	ND 0.095	ND 0.5	ND 0.5
trans-1,2-Dichloroethene	µg/L	8.1 J	ND 10	ND 2	1.4	ND 0.5	ND 0.50	ND 0.5	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.5	ND 0.5
trans-1,3-Dichloropropene	µg/L	ND 3.2	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.5	ND 0.5
Trichloroethene (TCE)	µg/L	160	900	170	68	ND 0.5	ND 0.50	ND 0.5	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.5	ND 0.5
Trichlorofluoromethane (CFC 11)	µg/L	ND 2.6	ND 20	ND 4	ND 2	ND 1	ND 1.0	ND 1	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 1	ND 1
Vinyl Acetate	µg/L	ND 3.8	ND 40 ,*1	ND 8 ,*1	ND 4 ,*1	ND 2	ND 2.0	ND 2	ND 0.19	ND 0.19	ND 0.19	ND 0.19	ND 2	ND 2
Vinyl Chloride	µg/L	95	ND 10	2.4	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.5	ND 0.5
Xylenes, Total	µg/L	ND 5.4	ND 10	ND 2	ND 1	ND 0.5	ND 0.50	ND 0.5	ND 0.27	ND 0.27	ND 0.27	ND 0.27	ND 0.5	ND 0.5
SM 5310C - TOTAL ORGANIC CARBON														
Total Organic Carbon	mg/L	3.5	--	--	--	--	--	--	--	ND 0.43	ND 0.35	ND 0.35	--	--
SM 4500S2-D - SULFIDE														
Sulfide	mg/L	0.36	--	--	--	--	--	--	--	ND 0.022	ND 0.022	ND 0.022	--	--
SM 2320B - ALKALINITY														
Bicarbonate Alkalinity	mg/L	950	--	--	--	--	--	--	--	ND 5.0	ND 5.0	ND 5.0	--	--
Carbonate Hydroxide	mg/L	ND 5	--	--	--	--	--	--	--	ND 5.0	ND 5.0	ND 5.0	--	--
Hydroxide Alkalinity	mg/L	ND 5	--	--	--	--	--	--	--	ND 5.0	ND 5.0	ND 5.0	--	--
Total Alkalinity	mg/L	950	--	--	--	--	--	--	--	ND 5.0	ND 5.0	ND 5.0	--	--
EPA 300.0 - NITRATE AND SULFATE														
Nitrate	mg/L	ND 0.5	--	--	--	--	--	--	--	ND 0.1	ND 0.1	ND 0.5	--	--
Sulfate	mg/L	95	--	--	--	--	--	--	--	ND 0.36	ND 0.36	ND 1.8	--	--
EPA 200.7 - ARSENIC AND MANGANESE														
Arsenic	µg/L	ND 19 H	--	--	--	--	--	--	--	ND 4.4	ND 4.4	ND 19 H	--	--
Manganese	µg/L	450 H,F1	--	--	--	--	--	--	--	8.9 J	2.0 J	ND 4.1 H	--	--
AM20GAX - HYDROGEN														
Hydrogen	nM	4.6	--	--	--	--	--	--	--	--	--	--	--	--
AM23G - VOLATILE FATTY ACIDS														
4-Methylpentanoic Acid	mg/L	ND 0.56	--	--	--	--	--	--	--	--	--	--	--	--
Acetic Acid	mg/L	1.8 J	--	--	--	--	--	--	--	--	--	--	--	--
Butyric Acid	mg/L	ND 0.58	--	--	--	--	--	--	--	--	--	--	--	--
Formic Acid	mg/L	50	--	--	--	--	--	--	--	--	--	--	--	--
i-Hexanoic Acid	mg/L	0.63 J	--	--	--	--	--	--	--	--	--	--	--	--
Isopentanoic Acid	mg/L	ND 0.61	--	--	--	--	--	--	--	--	--	--	--	--
Lactic Acid	mg/L	17	--	--	--	--	--	--	--	--	--	--	--	--
Pentanoic Acid	mg/L	ND 0.56	--	--	--	--	--	--	--	--	--	--	--	--
Propionic Acid	mg/L	ND 0.53	--	--	--	--	--	--	--	--	--	--	--	--
Pyruvic Acid	mg/L	ND 0.6	--	--	--	--	--	--	--	--	--	--	--	--
RSK175 - DISSOLVED GASES														
Carbon Dioxide	mg/L	271	--	--	--	--	--	--	--	--	--	--	--	--
Ethane	mg/L	0.00023 J	--	--	--	--	--	--	--	--	--	--	--	--
Ethene	mg/L	0.042	--	--	--	--	--	--	--	--	--	--	--	--
Methane	mg/L	9.2	--	--	--	--	--	--	--	--	--	--	--	--
QuantArray-Chlor - MICROBIAL														
APS	Cells/mL	43600	--	--	--	--	--	--	--	--	--	--	--	--
BVC	Cells/mL	<0.5	--	--	--	--	--	--	--	--	--	--	--	--
CER	Cells/mL	596	--	--	--	--	--	--	--	--	--	--	--	--
CFR	Cells/mL	<4.6	--	--	--	--	--	--	--	--	--	--	--	--
DCA	Cells/mL	<4.6	--	--	--	--	--	--	--	--	--	--	--	--
DCAR	Cells/mL	<4.6	--	--	--	--	--	--	--	--	--	--	--	--
DCM	Cells/mL	<4.6	--	--	--	--	--	--	--	--	--	--	--	--
DCMA	Cells/mL	<4.6	--	--	--	--	--	--	--	--	--	--	--	--
DECO	Cells/mL	3440	--	--	--	--	--	--	--	--	--	--	--	--
DHBt	Cells/mL	10400	--	--	--	--	--	--	--	--	--	--	--	--
DHC	Cells/mL	4660	--	--	--	--	--	--	--	--	--	--	--	--
DHG	Cells/mL	36400	--	--	--	--	--	--	--	--	--	--	--	--
DSB	Cells/mL	9180	--	--	--	--	--	--	--	--	--	--	--	--
DSM	Cells/mL	46.3	--	--	--	--	--	--	--	--	--	--	--	--
EBAC	Cells/mL	1340000	--	--	--	--	--	--	--	--	--	--	--	--
EtnC	Cells/mL	<4.6	--	--	--	--	--	--	--	--	--	--	--	--
EtnE	Cells/mL	<4.6	--	--	--	--	--	--	--	--	--	--	--	--
MGN	Cells/mL	1350	--	--	--	--	--	--	--	--	--	--	--	--
PCE-1	Cells/mL	<4.6	--	--	--	--	--	--	--	--	--	--	--	--
PCE-2	Cells/mL	1110	--	--	--	--	--	--	--	--	--	--	--	--
PHE	Cells/mL	32.1	--	--	--	--	--	--	--	--	--	--	--	--
RDEG	Cells/mL	132	--	--	--	--	--	--	--	--	--	--	--	--
RMO	Cells/mL	<4.6	--	--	--	--	--	--	--	--	--	--	--	--
SMMO	Cells/mL	<4.6	--	--	--	--	--	--	--	--	--	--	--	--
TCBO	Cells/mL	<4.6	--	--	--	--	--	--	--	--	--	--	--	--
TCE	Cells/mL	630	--	--	--	--	--	--	--	--	--	--	--	--
TDR	Cells/mL	<4.6	--	--	--	--	--	--	--	--	--	--	--	--
TOD	Cells/mL	202	--	--	--	--	--	--	--	--	--	--	--	--
VCR	Cells/mL	496	--	--	--	--	--	--	--	--	--	--	--	--

For definitions and abbreviations please refer to the notes on page 12.

TABLE 6
GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID		Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank
Sample Date		9/16/20	12/15/20	12/16/20	12/17/20	12/18/20	1/18/21	1/19/21	1/20/21	2/15/21	2/16/21	2/17/21	5/17/21	5/18/21
Sample Purpose		TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB
Analysis Type		INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT	INIT
Parameter	Result Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 8260B - VOLATILE ORGANIC COMPOUNDS														
1,1,1,2-Tetrachloroethane	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1
1,1,1-Trichloroethane (TCA)	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.1	ND 0.1	ND 0.1	ND 0.17	ND 0.17
1,1,2,2-Tetrachloroethane	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.11	ND 0.11	ND 0.11	ND 0.1	ND 0.1
1,1,2-Trichloroethane	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.12	ND 0.12	ND 0.12	ND 0.11	ND 0.11
1,1,2-Trichlorotrifluoroethane (CFC 113)	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.17	ND 0.17	ND 0.17	ND 0.12	ND 0.12
1,1-Dichloroethane (1,1-DCA)	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1
1,1-Dichloroethene (1,1-DCE)	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13
1,1-Dichloropropene	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12
1,2,3-Trichlorobenzene	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.4	ND 0.4	ND 0.4	ND 0.4	ND 0.4
1,2,3-Trichloropropane	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13
1,2,4-Trichlorobenzene	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.25	ND 0.25	ND 0.25	ND 0.25	ND 0.25
1,2,4-Trimethylbenzene	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.32	ND 0.32	ND 0.32	ND 0.32	ND 0.32
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1 *+	ND 0.2	ND 0.2	ND 0.2	ND 0.2	ND 0.2
1,2-Dibromoethane (EDB)	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12
1,2-Dichlorobenzene	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.097	ND 0.097	ND 0.097	ND 0.097	ND 0.097
1,2-Dichloroethane	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.14	ND 0.14	ND 0.14	ND 0.14	ND 0.14
1,2-Dichloropropane	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.15	ND 0.15	ND 0.15	ND 0.15	ND 0.15
1,3,5-Trimethylbenzene	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.16
1,3-Dichlorobenzene	µg/L	ND 0.5	ND 1	ND 1	ND 1	ND 1	ND 0.5	ND 0.5	ND 0.5	ND 0.086	ND 0.086	ND 0.086	ND 0.086	ND 0.086
1,3-Dichloropropane	µg/L	ND 1	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 1	ND 1	ND 1	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1
1,4-Dichlorobenzene	µg/L	ND 0.5	ND 1	ND 1	ND 1	ND 1	ND 0.5	ND 0.5	ND 0.5	ND 0.083	ND 0.083	ND 0.083	ND 0.083	ND 0.083
2,2-Dichloropropane	µg/L	ND 1	ND 2	ND 2	ND 2	ND 2	ND 1	ND 1	ND 1	ND 0.46	ND 0.46	ND 0.46	ND 0.46	ND 0.46
2-Butanone (MEK)	µg/L	ND 2	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 2	ND 2	ND 2	ND 0.33	ND 0.33	ND 0.33	ND 0.33	0.36 J
2-Chlorotoluene	µg/L	ND 0.5	ND 2	ND 2	ND 2	ND 2	ND 0.5	ND 0.5	ND 0.5	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11
2-Hexanone	µg/L	ND 2	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 2	ND 2	ND 2	ND 0.17	ND 0.17	ND 0.17	ND 0.17	ND 0.17
4-Chlorotoluene	µg/L	ND 0.5	ND 1	ND 1	ND 1	ND 1	ND 0.5	ND 0.5	ND 0.5	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1
4-Isopropyltoluene	µg/L	ND 1	ND 2	ND 2	ND 2	ND 2	ND 1	ND 1	ND 1	ND 0.15	ND 0.15	ND 0.15	ND 0.15	ND 0.15
Acetone	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 3.8	ND 3.8	ND 3.8	ND 3.8	ND 3.8
Benzene	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.08	ND 0.08	ND 0.08	ND 0.08	ND 0.08
Bromobenzene	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.091	ND 0.091	ND 0.091	ND 0.091	ND 0.091
Bromochloromethane	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.18
Bromodichloromethane	µg/L	ND 0.5	ND 1	ND 1	ND 1	ND 1	ND 0.5	ND 0.5	ND 0.5	ND 0.14	ND 0.14	ND 0.14	ND 0.14	ND 0.14
Bromoform	µg/L	ND 1	ND 2	ND 2	ND 2	ND 2	ND 1	ND 1	ND 1	ND 0.19	ND 0.19 *+	ND 0.19	ND 0.19	ND 0.19
Bromomethane	µg/L	ND 1	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 1	ND 1	ND 1	ND 0.21	ND 0.21	ND 0.21	ND 0.21	ND 0.21
Carbon Disulfide	µg/L	ND 2	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 2	ND 2	ND 2	ND 0.36	ND 0.36	ND 0.36	ND 0.36	ND 0.36
Carbon Tetrachloride	µg/L	ND 0.5	ND 1	ND 1	ND 1	ND 1	ND 0.5	ND 0.5	ND 0.5	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12
Chlorobenzene	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.07	ND 0.07	ND 0.07	ND 0.07	ND 0.07
Chloroethane	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.24	ND 0.24	ND 0.24	ND 0.24	ND 0.24
Chloroform	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12
Chloromethane	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.26	ND 0.26	ND 0.26	ND 0.26	ND 0.26
cis-1,2-Dichloroethene	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.18
cis-1,3-Dichloropropene	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.15	ND 0.15	ND 0.15	ND 0.15	ND 0.15
Dibromochloromethane	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.16
Dibromomethane	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.17	ND 0.17	ND 0.17	ND 0.17	ND 0.17
Dichlorodifluoromethane (CFC 12)	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.32	ND 0.32	ND 0.32	ND 0.32	ND 0.32
Ethylbenzene	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.084	ND 0.084	ND 0.084	ND 0.084	ND 0.084
Hexachlorobutadiene	µg/L	ND 1	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 1	ND 1	ND 1	ND 0.23	ND 0.23 *+	ND 0.23	ND 0.23	ND 0.23
Isopropylbenzene	µg/L	ND 0.5	ND 1	ND 1	ND 1	ND 1	ND 0.5	ND 0.5	ND 0.5	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11
Methyl Isobutyl Ketone	µg/L	ND 2	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 2	ND 2	ND 2	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11
Methylene Chloride	µg/L	ND 1	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 1	ND 1	ND 1	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.16
MTBE	µg/L	ND 0.5	ND 1	ND 1	ND 1	ND 1	ND 0.5	ND 0.5	ND 0.5	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12
Naphthalene	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.48	ND 0.48	ND 0.48	ND 0.48	ND 0.48
n-Butylbenzene	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.18
n-Propylbenzene	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11
sec-Butylbenzene	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.14	ND 0.14	ND 0.14	ND 0.14	ND 0.14
Styrene	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13
tert-Butylbenzene	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13
Tetrachloroethene (PCE)	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1
Toluene	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.095	ND 0.095	ND 0.095	ND 0.095	ND 0.095
trans-1,2-Dichloroethene	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11
trans-1,3-Dichloropropene	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.16
Trichloroethene (TCE)	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1
Trichlorofluoromethane (CFC 11)	µg/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13
Vinyl Acetate	µg/L	ND 2	ND 2	ND 2	ND 2	ND 2	ND 2	ND 2	ND 2	ND 0.19	ND 0.19	ND 0.19	ND 0.19	ND 0.19
Vinyl Chloride	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.18
Xylenes, Total	µg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.27	ND 0.27	ND 0.27	ND 0.27	ND 0.27
SM 5310C - TOTAL ORGANIC CARBON														
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
SM 4500S2-D - SULFIDE														
Sulfide	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
SM 2320B - ALKALINITY														
Bicarbonate Alkalinity	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbonate Hydroxide	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydroxide Alkalinity	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Alkalinity	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
EPA 300.0 - NITRATE AND SULFATE														
Nitrate	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
EPA 200.7 - ARSENIC AND MANGANESE														
Arsenic	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
AM20GAX - HYDROGEN														
Hydrogen	nM	--	--	--	--	--	--	--	--	--	--	--	--	--
AM23G - VOLATILE FATTY ACIDS														
4-Methylpentanoic Acid	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Acetic Acid	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Butyric Acid	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Formic Acid	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
i-Hexanoic Acid	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Isopentanoic Acid	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Lactic Acid	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Pentanoic Acid	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Propionic Acid	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Pyruvic Acid	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
RSK175 - DISSOLVED GASES														
Carbon Dioxide	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethane	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethene	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Methane	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
QuantArray-Chlor - MICROBIAL														
APS	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
BVC	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
CER	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
CFR	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
DCA	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
DCAR	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
DCM	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
DCMA	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
DECO	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
DHBt	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
DHC	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
DHG	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
DSB	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
DSM	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
EBAC	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
EtnC	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
EtnE	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
MGN	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
PCE-1	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
PCE-2	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
PHE	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
RDEG	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
RMO	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
SMMO	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
TCBO	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
TCE	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
TDR	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
TOD	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--
VCR	Cells/mL	--	--	--	--	--	--	--	--	--	--	--	--	--

For definitions and abbreviations please refer to the notes on page 12.

TABLE 6
GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID		Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank
Sample Date		5/19/21	8/17/21	8/18/21	8/19/21	11/8/21	11/9/21	11/10/21
Sample Purpose		TB	TB	TB	TB	TB	TB	TB
Analysis Type		INIT	INIT	INIT	INIT	INIT	INIT	INIT
Parameter	Result Unit	Result	Result	Result	Result	Result	Result	Result
EPA 8260B - VOLATILE ORGANIC COMPOUNDS								
1,1,1,2-Tetrachloroethane	µg/L	ND 0.1 H	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1 *+	ND 0.1
1,1,1-Trichloroethane (TCA)	µg/L	ND 0.17 H	ND 0.17	ND 0.17	ND 0.17	ND 0.17	ND 0.17	ND 0.17
1,1,2,2-Tetrachloroethane	µg/L	ND 0.1 H	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1
1,1,2-Trichloroethane	µg/L	ND 0.11 H	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11
1,1,2-Trichlorotrifluoroethane (CFC 113)	µg/L	ND 0.12 H	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12
1,1-Dichloroethane (1,1-DCA)	µg/L	ND 0.1 H	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1
1,1-Dichloroethene (1,1-DCE)	µg/L	ND 0.13 H	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13
1,1-Dichloropropene	µg/L	ND 0.12 H	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12
1,2,3-Trichlorobenzene	µg/L	ND 0.4 H	ND 0.4	ND 0.4	ND 0.4	ND 0.4	ND 0.4	ND 0.4
1,2,3-Trichloropropane	µg/L	ND 0.13 H	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13
1,2,4-Trichlorobenzene	µg/L	ND 0.25 H	ND 0.25	ND 0.25	ND 0.25	ND 0.25 *+	ND 0.25	ND 0.25
1,2,4-Trimethylbenzene	µg/L	ND 0.32 H	ND 0.32	ND 0.32	ND 0.32	ND 0.32	ND 0.32	ND 0.32
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	ND 0.2 H	ND 0.2	ND 0.2	ND 0.2	ND 0.2	ND 0.2	ND 0.2
1,2-Dibromoethane (EDB)	µg/L	ND 0.12 H	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12
1,2-Dichlorobenzene	µg/L	ND 0.097 H	ND 0.097	ND 0.097	ND 0.097	ND 0.097	ND 0.097	ND 0.097
1,2-Dichloroethane	µg/L	ND 0.14 H	ND 0.14	ND 0.14	ND 0.14	ND 0.14	ND 0.14	ND 0.14
1,2-Dichloropropane	µg/L	ND 0.15 H	ND 0.15	ND 0.15	ND 0.15	ND 0.15	ND 0.15	ND 0.15
1,3,5-Trimethylbenzene	µg/L	ND 0.16 H	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.16
1,3-Dichlorobenzene	µg/L	ND 0.086 H	ND 0.086	ND 0.086	ND 0.086	ND 0.086	ND 0.086	ND 0.086
1,3-Dichloropropane	µg/L	ND 0.1 H	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1
1,4-Dichlorobenzene	µg/L	ND 0.083 H	ND 0.083	ND 0.083	ND 0.083	ND 0.083	ND 0.083	ND 0.083
2,2-Dichloropropane	µg/L	ND 0.46 H	ND 0.46	ND 0.46	ND 0.46	ND 0.46	ND 0.46	ND 0.46
2-Butanone (MEK)	µg/L	ND 0.33 H	0.34 J	ND 0.33	ND 0.33	ND 0.33	ND 0.33	ND 0.33
2-Chlorotoluene	µg/L	ND 0.11 H	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11
2-Hexanone	µg/L	ND 0.17 H	ND 0.17	ND 0.17	ND 0.17	ND 0.17	ND 0.17	ND 0.17
4-Chlorotoluene	µg/L	ND 0.1 H	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1
4-Isopropyltoluene	µg/L	ND 0.15 H	ND 0.15	ND 0.15	ND 0.15	ND 0.15	ND 0.15	ND 0.15
Acetone	µg/L	ND 3.8 H	ND 3.8	ND 3.8	ND 3.8	ND 3.8	ND 3.8	ND 3.8
Benzene	µg/L	ND 0.08 H	ND 0.08	ND 0.08	ND 0.08	ND 0.08	ND 0.08	ND 0.08
Bromobenzene	µg/L	ND 0.091 H	ND 0.091	ND 0.091	ND 0.091	ND 0.091	ND 0.091	ND 0.091
Bromochloromethane	µg/L	ND 0.18 H	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.18
Bromodichloromethane	µg/L	ND 0.14 H	ND 0.14	ND 0.14	ND 0.14	ND 0.14	ND 0.14	ND 0.14
Bromoform	µg/L	ND 0.19 H	ND 0.19	ND 0.19	ND 0.19	ND 0.19	ND 0.19 *+	ND 0.19
Bromomethane	µg/L	ND 0.21 H	ND 0.21	ND 0.21	ND 0.21	ND 0.21	ND 0.21	ND 0.21
Carbon Disulfide	µg/L	ND 0.36 H	ND 0.36	ND 0.36	ND 0.36	ND 0.36	0.9 J,B	ND 0.36
Carbon Tetrachloride	µg/L	ND 0.12 H	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12 *+	ND 0.12
Chlorobenzene	µg/L	ND 0.07 H	ND 0.07	ND 0.07	ND 0.07	ND 0.07	ND 0.07	ND 0.07
Chloroethane	µg/L	ND 0.24 H	ND 0.24	ND 0.24	ND 0.24	ND 0.24	ND 0.24	ND 0.24
Chloroform	µg/L	ND 0.12 H	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12
Chloromethane	µg/L	ND 0.26 H	ND 0.26	ND 0.26	ND 0.26	ND 0.26	ND 0.26	ND 0.26
cis-1,2-Dichloroethene	µg/L	ND 0.18 H	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.18
cis-1,3-Dichloropropene	µg/L	ND 0.15 H	ND 0.15	ND 0.15	ND 0.15	ND 0.15	ND 0.15	ND 0.15
Dibromochloromethane	µg/L	ND 0.16 H	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.16
Dibromomethane	µg/L	ND 0.17 H	ND 0.17	ND 0.17	ND 0.17	ND 0.17	ND 0.17	ND 0.17
Dichlorodifluoromethane (CFC 12)	µg/L	ND 0.32 H	ND 0.32	ND 0.32	ND 0.32	ND 0.32	ND 0.32	ND 0.32
Ethylbenzene	µg/L	ND 0.084 H	ND 0.084	ND 0.084	ND 0.084	ND 0.084	ND 0.084	ND 0.084
Hexachlorobutadiene	µg/L	ND 0.23 H	ND 0.23	ND 0.23	ND 0.23	ND 0.23 *+	ND 0.23 *+	ND 0.23
Isopropylbenzene	µg/L	ND 0.11 H	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11
Methyl Isobutyl Ketone	µg/L	ND 0.11 H	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11
Methylene Chloride	µg/L	ND 0.16 H	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.16
MTBE	µg/L	ND 0.12 H	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12	ND 0.12
Naphthalene	µg/L	ND 0.48 H	ND 0.48	ND 0.48	ND 0.48	ND 0.48	ND 0.48	ND 0.48
n-Butylbenzene	µg/L	ND 0.18 H	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.18
n-Propylbenzene	µg/L	ND 0.11 H	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11
sec-Butylbenzene	µg/L	ND 0.14 H	ND 0.14	ND 0.14	ND 0.14	ND 0.14	ND 0.14	ND 0.14
Styrene	µg/L	ND 0.13 H	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13
tert-Butylbenzene	µg/L	ND 0.13 H	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13
Tetrachloroethene (PCE)	µg/L	ND 0.1 H	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1
Toluene	µg/L	ND 0.095 H	ND 0.095	ND 0.095	ND 0.095	ND 0.095	ND 0.095	ND 0.095
trans-1,2-Dichloroethene	µg/L	ND 0.11 H	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11	ND 0.11
trans-1,3-Dichloropropene	µg/L	ND 0.16 H	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.16	ND 0.16
Trichloroethene (TCE)	µg/L	ND 0.1 H	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1
Trichlorofluoromethane (CFC 11)	µg/L	ND 0.13 H	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13	ND 0.13
Vinyl Acetate	µg/L	ND 0.19 H	ND 0.19	ND 0.19	ND 0.19	ND 0.19 *+	ND 0.19	ND 0.19
Vinyl Chloride	µg/L	ND 0.18 H	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.18	ND 0.18
Xylenes, Total	µg/L	ND 0.27 H	ND 0.27	ND 0.27	ND 0.27	ND 0.27	ND 0.27	ND 0.27
SM 5310C - TOTAL ORGANIC CARBON								
Total Organic Carbon	mg/L	--	--	--	--	--	--	--
SM 4500S2-D - SULFIDE								
Sulfide	mg/L	--	--	--	--	--	--	--
SM 2320B - ALKALINITY								
Bicarbonate Alkalinity	mg/L	--	--	--	--	--	--	--
Carbonate Hydroxide	mg/L	--	--	--	--	--	--	--
Hydroxide Alkalinity	mg/L	--	--	--	--	--	--	--
Total Alkalinity	mg/L	--	--	--	--	--	--	--
EPA 300.0 - NITRATE AND SULFATE								
Nitrate	mg/L	--	--	--	--	--	--	--
Sulfate	mg/L	--	--	--	--	--	--	--
EPA 200.7 - ARSENIC AND MANGANESE								
Arsenic	µg/L	--	--	--	--	--	--	--
Manganese	µg/L	--	--	--	--	--	--	--
AM20GAX - HYDROGEN								
Hydrogen	nM	--	--	--	--	--	--	--
AM23G - VOLATILE FATTY ACIDS								
4-Methylpentanoic Acid	mg/L	--	--	--	--	--	--	--
Acetic Acid	mg/L	--	--	--	--	--	--	--
Butyric Acid	mg/L	--	--	--	--	--	--	--
Formic Acid	mg/L	--	--	--	--	--	--	--
i-Hexanoic Acid	mg/L	--	--	--	--	--	--	--
Isopentanoic Acid	mg/L	--	--	--	--	--	--	--
Lactic Acid	mg/L	--	--	--	--	--	--	--
Pentanoic Acid	mg/L	--	--	--	--	--	--	--
Propionic Acid	mg/L	--	--	--	--	--	--	--
Pyruvic Acid	mg/L	--	--	--	--	--	--	--
RSK175 - DISSOLVED GASES								
Carbon Dioxide	mg/L	--	--	--	--	--	--	--
Ethane	mg/L	--	--	--	--	--	--	--
Ethene	mg/L	--	--	--	--	--	--	--
Methane	mg/L	--	--	--	--	--	--	--
QuantArray-Chlor - MICROBIAL								
APS	Cells/mL	--	--	--	--	--	--	--
BVC	Cells/mL	--	--	--	--	--	--	--
CER	Cells/mL	--	--	--	--	--	--	--
CFR	Cells/mL	--	--	--	--	--	--	--
DCA	Cells/mL	--	--	--	--	--	--	--
DCAR	Cells/mL	--	--	--	--	--	--	--
DCM	Cells/mL	--	--	--	--	--	--	--
DCMA	Cells/mL	--	--	--	--	--	--	--
DECO	Cells/mL	--	--	--	--	--	--	--
DHBt	Cells/mL	--	--	--	--	--	--	--
DHC	Cells/mL	--	--	--	--	--	--	--
DHG	Cells/mL	--	--	--	--	--	--	--
DSB	Cells/mL	--	--	--	--	--	--	--
DSM	Cells/mL	--	--	--	--	--	--	--
EBAC	Cells/mL	--	--	--	--	--	--	--
EtnC	Cells/mL	--	--	--	--	--	--	--
EtnE	Cells/mL	--	--	--	--	--	--	--
MGN	Cells/mL	--	--	--	--	--	--	--
PCE-1	Cells/mL	--	--	--	--	--	--	--
PCE-2	Cells/mL	--	--	--	--	--	--	--
PHE	Cells/mL	--	--	--	--	--	--	--
RDEG	Cells/mL	--	--	--	--	--	--	--
RMO	Cells/mL	--	--	--	--	--	--	--
SMMO	Cells/mL	--	--	--	--	--	--	--
TCBO	Cells/mL	--	--	--	--	--	--	--
TCE	Cells/mL	--	--	--	--	--	--	--
TDR	Cells/mL	--	--	--	--	--	--	--
TOD	Cells/mL	--	--	--	--	--	--	--
VCR	Cells/mL	--	--	--	--	--	--	--

For definitions and abbreviations please refer to the notes on page 12.

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TABLE 6
GROUNDWATER SAMPLING RESULTS
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

NOTES:

Method 200.7: Not sampled on Month 1 (15-18 December 2020) sampling event. For Month 2 (18-20 January 2021) and Month 3 (15-17 February 2021) sampling events, samples were analyzed for total recoverable metals. For Quarter 2 (17-19 May 2021), Quarter 3 (17-19 August 2021), and Quarter 4 (8-10 November 2021) samples were analyzed for dissolved metals.

-- = No data available
*+ = Laboratory control sample and/or Laboratory control sample duplicate is outside acceptance limits, high biased
^1+ = Initial Calibration Verification (ICV) is outside acceptance limits, high biased
µg/L = Micrograms per liter
B = Compound was found in the blank and sample
Cells/mL = Cells per milliliter
F1 = Matrix spike and/or Matrix spike duplicate recovery exceeds control limits
F2 = Matrix spike and/or Matrix spike duplicate relative percent difference exceeds control limits
FB = Field blank
FD = Field duplicate
H = Sample was prepped or analyzed beyond the specified holding time
INIT = Initial run
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value
MDL =Method detection limit
NA = Not applicable
ND 0.15 = Not detected above indicated laboratory detection limit
nM = Nanomoles per liter
REANL = Reanalysis run
REG = Regular sample
RL = Reporting limit
TB = Trip blank

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TABLE 7
SOIL VAPOR SAMPLING RESULTS: ASTM D-1946
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID	Sample Depth (ft-bgs)	Sample Purpose	Sample Date	Methane (ppm)	Leak Check Compound		
					Helium (%)	Average Shroud Helium (%)	Leak Ratio[1] (%)
SGI001A	4.75	REG	02/18/2021	ND 980	ND 0.15	31.7	NE
		REG	03/17/2021	ND 1500	**0.23**	30.2	0.76
		REG	04/16/2021	ND 1500	ND 0.15	16.1	NE
		REG	05/21/2021	ND 1500	ND 0.15	12.1	NE
		REG	06/18/2021	ND 2000	ND 0.2	14.2	NE
		REG	07/15/2021	ND 1600	ND 0.16	18.2	NE
SGI001B	9.8	REG	02/18/2021	ND 980	ND 0.15	31.9	NE
		REG	03/17/2021	ND 1800	ND 0.18	29.3	NE
		REG	04/16/2021	ND 1600	ND 0.16	13.9	NE
		REG	05/21/2021	ND 2300	ND 0.23	17.1	NE
		REG	06/18/2021	ND 2300	ND 0.23	12.5	NE
		REG	07/15/2021	ND 2100	ND 0.21	16.8	NE
SGI002A	4.75	REG	02/19/2021	ND 980	ND 0.15	12.3	NE
		REG	03/17/2021	ND 1500	ND 0.15	11.5	NE
		REG	04/16/2021	ND 1500	ND 0.15	13.4	NE
		FD	04/16/2021	ND 1500	ND 0.15		NE
		REG	05/21/2021	ND 1500	ND 0.15	12.8	NE
		FD	05/21/2021	ND 1500	ND 0.15		NE
		REG	06/18/2021	ND 1700	ND 0.17	11.2	NE
		FD	06/18/2021	ND 1600	ND 0.16		NE
		REG	07/15/2021	ND 2000	ND 0.2	10.0	NE
SGI002B	9.35	REG	02/18/2021	ND 980	ND 0.15	13.0	NE
		REG	03/17/2021	ND 1500	ND 0.15	13.9	NE
		FD	03/17/2021	ND 1500	ND 0.15		NE
		REG	04/16/2021	ND 1500	ND 0.15	14.8	NE
		REG	05/21/2021	ND 1500	ND 0.15	17.3	NE
		REG	06/18/2021	ND 1600	ND 0.16	12.9	NE
		REG	07/15/2021	ND 1600	ND 0.16	21.4	NE
		FD	07/15/2021	ND 1600	ND 0.16		NE

TABLE 7
SOIL VAPOR SAMPLING RESULTS: ASTM D-1946
EAB PHASE II EVALUATION REPORT
SIGNETICS SITE

Location ID	Sample Depth (ft-bgs)	Sample Purpose	Sample Date	Methane (ppm)	Leak Check Compound		
					Helium (%)	Average Shroud Helium (%)	Leak Ratio[1] (%)
SGI003A	3.3	REG	02/19/2021	ND 980	ND 0.15	15.5	NE
		REG	03/17/2021	ND 1500	ND 0.15	15.3	NE
		REG	04/16/2021	ND 1500	ND 0.15	16.8	NE
		REG	05/21/2021	ND 1500	ND 0.15	16.2	NE
		REG	06/18/2021	ND 1600	ND 0.16	12.0	NE
		REG	07/15/2021	**8900**	ND 0.16	17.8	NE
		REG	08/06/2021	ND 1600	ND 0.16	20.3	NE
SGI003B	6.05	REG	02/19/2021	ND 980	ND 0.15	16.8	NE
		FD	02/19/2021	ND 980	ND 0.15		NE
		REG	03/17/2021	ND 1500	ND 0.15	12.8	NE
		REG	04/16/2021	ND 1500	ND 0.15	24.4	NE
		REG	05/21/2021	ND 1500	ND 0.15	20.2	NE
		REG	06/18/2021	ND 1500	**0.39**	15.5	2.5
		REG	07/15/2021	ND 1600	ND 0.16	22.0	NE
		REG	08/06/2021	ND 1500	**0.23**	22.2	1.0
SGI-BLANK	N/A	FB	02/18/2021	ND 980	ND 0.15	NM	NM
		FB	02/19/2021	ND 980	ND 0.15		
		FB	03/17/2021	ND 1500	ND 0.15		
		FB	04/16/2021	ND 1500	ND 0.15		
		FB	05/21/2021	ND 1500	ND 0.15		
		FB	06/18/2021	ND 1600	**43**		
		FB	07/15/2021	ND 1600	ND 0.16		

NOTES:

[1]Estimated Leak Ratio (%) = [Concentration of Helium in Sample (%)] / [Concentration of Helium in Shroud (%)] X 100. An ambient air leak up to 5% is acceptable, per RWQCB/DTSC, 2015.

Samples analyzed for fixed gases by ASTM Method D-1946.

Detections shown in **bold**.

% = Percent.

FB = Field blank

FD = Field duplicate

ft-bgs = Feet below ground surface.

NA = Not applicable.

ND 0.15 = Not detected above indicated laboratory detection limit.

NE = Not estimated since helium not detected in sample.

NM = Not measured.

ppm = parts per million.

REG = Regular sample.

TABLE 8
ESTIMATED TCE MASS IN GROUDNWATER
WITHIN PHASE II TREATABILITY STUDY AREA
SIGNETICS SITE

TCE Contours[5] (µg/L)	Baseline 14-16 September 2020		Fourth Quarter 8-10 November 2021	
	"A" Aquifer Wells	TCE	"A" Aquifer Wells	TCE
Wells between boundary and 10 µg/L contour[3,5]	-	-	S137A	1.2
	-	-	S138A	< 10[1]
	-	-	S143A	9.7
	-	-	S158A	< 10[1]
	-	-	S159A	0.33
Geometric mean (µg/L)		**NA[2]**		**3.3**
Wells between 10 µg/L and 100 µg/L contours (or between boundary and 100 µg/L contour)[3]	S137A	17	S139A	12
	S139A	17	-	-
Geometric mean (µg/L)		**17**		**12**
Wells between 100 µg/L and 1,000 µg/L contours	S143A	840	S140A	< 200[1]
	S159A	140	S141A	400
	S160A	500	S160A	160
Geometric mean (µg/L)		**389**		**234**
Wells between 1,000 µg/L and 10,000 µg/L contours	S138A	6,800	S146A	4,100
	S141A	1,400	-	-
	S146A	5,700	-	-
	S158A	8,100	-	-
Geometric mean (µg/L)		**4,579**		**4,100**
Area >10,000 µg/L contour	S140A	15,000	-	-
	-	-	-	-
Geometric mean (µg/L)		**15,000**		**NA[2]**

Site Areas[5] (sq ft.)	Baseline[5] 14-16 September 2020	Fourth Quarter[5] 8-10 November 2021
Area between boundary and 10 µg/L contour[3]	NA[2]	6,873
Area between 10 µg/L and 100 µg/L contours (or between boundary and 100 µg/L contour)[3]	4,070	8,296
Area between 100 µg/L and 1,000 µg/L contours	6,766	2,304
Area between 1,000 µg/L and 10,000 µg/L contours	6,350	410
Area >10,000 µg/L contour	697	NA[2]
Approximate TCE Mass (lb)	**19.0**	**1.1**

TCE Mass Reduction (lb):	**17.9**
TCE Mass Percent Reduction:	**94%**

Notes:

1. Non-detect TCE results shown with "<" and reporting limit. Geometric mean calculation uses reporting limit.
2. Not Applicable - TCE results outside limits of TCE contours.
3. There is no 10 µg/L TCE contour for Baseline conditions, see Figure 5.
4. Calculation assumes 0.36 for porosity (Locus, 2021) and 20 feet for aquifer thickness in the "A" Aquifer.
5. Square feet calcuated for areas within treatability study boundary, as defined in Figures 5 & 6. Areas estimated using ArcGIS.
6. TCE concentrations are presented in µg/L.

TABLE 8
ESTIMATED TCE MASS IN GROUDNWATER
WITHIN PHASE II TREATABILITY STUDY AREA
SIGNETICS SITE

CALCULATIONS PERFORMED FOR TABLE 8:

CALCUALTED VALUES	14-16 SEP 2020 (Baseline)		8-10 NOV 2021 (Q4)	
	MEANS	AREAS	MEANS	AREAS
Area between boundary and 10 µg/L contour[3]	NA[2]	NA[2]	3.3	6,873
Area between 10 µg/L and 100 µg/L contours (or between boundary and 100 µg/L contour)[3]	17	4,070	12	8,296
Area between 100 µg/L and 1,000 µg/L contours	389	6,766	234	2,304
Area between 1,000 µg/L and 10,000 µg/L contours	4,579	6,350	4,100	410
Area >10,000 µg/L contour	15,000	697	NA[2]	NA[2]

ASSUMPTIONS		
POROSITY	0.36	
SATURATED AQUIFER THICKNESS	20	feet

CONVERSION FACTORS			
28.312	liters	1	cubic foot
0.000001	µg	1	g
453.59	g	1	lbs

Baseline TCE Mass Calculation

$$\left(\frac{17\mu g}{L}\right)\times\left(\frac{1\ g}{10^6\ ug}\right)\times(4{,}070\ ft^2)\times(20\ ft)\times(0.36)\times\left(\frac{28.312\ L}{1ft^3}\right)\times\left(\frac{1\ lbs}{453.59\ g}\right)=0.031\ lbs$$

$$\left(\frac{389\mu g}{L}\right)\times\left(\frac{1\ g}{10^6\ ug}\right)\times(6{,}766\ ft^2)\times(20\ ft)\times(0.36)\times\left(\frac{28.312\ L}{1ft^3}\right)\times\left(\frac{1\ lbs}{453.59\ g}\right)=1.2\ lbs$$

$$\left(\frac{4{,}579\ \mu g}{L}\right)\times\left(\frac{1\ g}{10^6\ ug}\right)\times(6{,}350\ ft^2)\times(20\ ft)\times(0.36)\times\left(\frac{28.312\ L}{1ft^3}\right)\times\left(\frac{1\ lbs}{453.59\ g}\right)=13\ lbs$$

$$\left(\frac{15{,}000\ \mu g}{L}\right)\times\left(\frac{1\ g}{10^6\ ug}\right)\times(697\ ft^2)\times(20\ ft)\times(0.36)\times\left(\frac{28.312\ L}{1ft^3}\right)\times\left(\frac{1\ lbs}{453.59\ g}\right)=4.7\ lbs$$

$$\sum TCE\ mass\ of\ contour\ areas=19\ lbs$$

Fourth Quarter TCE Mass Calculation

$$\left(\frac{3.3\mu g}{L}\right)\times\left(\frac{1\ g}{10^6\ ug}\right)\times(6{,}873\ ft^2)\times(20\ ft)\times(0.36)\times\left(\frac{28.312\ L}{1ft^3}\right)\times\left(\frac{1\ lbs}{453.59\ g}\right)=0.010\ lbs$$

$$\left(\frac{12\ \mu g}{L}\right)\times\left(\frac{1\ g}{10^6\ ug}\right)\times(8{,}296\ ft^2)\times(20\ ft)\times(0.36)\times\left(\frac{28.312\ L}{1ft^3}\right)\times\left(\frac{1\ lbs}{453.59\ g}\right)=0.045\ lbs$$

$$\left(\frac{234\ \mu g}{L}\right)\times\left(\frac{1\ g}{10^6\ ug}\right)\times(2{,}304\ ft^2)\times(20\ ft)\times(0.36)\times\left(\frac{28.312\ L}{1ft^3}\right)\times\left(\frac{1\ lbs}{453.59\ g}\right)=0.24\ lbs$$

$$\left(\frac{4{,}100\ \mu g}{L}\right)\times\left(\frac{1\ g}{10^6\ ug}\right)\times(410\ ft^2)\times(20\ ft)\times(0.36)\times\left(\frac{28.312\ L}{1ft^3}\right)\times\left(\frac{1\ lbs}{453.59\ g}\right)=0.76\ lbs$$

$$\sum TCE\ mass\ of\ contour\ areas=1.1\ lbs$$

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TABLE 9
ANALYTICAL RESULTS SUMMARY FOR EVALUATION OF KEY DATA
OCTOBER 2016 – NOVEMBER 2021
SIGNETICS SITE

	Phase I Results		Phase II Monitoring Events							% Reductions & Action Levels		
	Phase I Baseline 19–20 Oct. 2016	Phase I Quarter 4 15–16 Nov. 2017	14–16 Sep. 2020 (Baseline Monitoring)	15–18 Dec. 2020 (Month 1 / 30 Days)	18–20 Jan. 2021 (Month 2/ 60 Days)	15–17 Feb. 2021 (Month 3/ 90 Days)	17–19 May 2021 (Quarter 2/ 180 days)	17–19 Aug. 2021 (Quarter 3/ 270 days)	8–10 Nov. 2021 (Quarter 4/ 360 days)	Phase II % Reduction	Overall % Reduction Phase I and II	Action Level (µg/L)
S137A												
PCE	3.1	3.1	<5	<2	<0.5	<0.1	<0.1	<0.2	<0.2	NA	>93.5%	5
TCE	270	12	17	2	0.5	0.52	1.1	0.81 J	1.2	92.9%	99.6%	5
cis-1,2-DCE	290	410	380	190	15	4	4.8	21	25	93.4%	91.4%	6
Vinyl Chloride	3.1	110	38	180	110	37	23	77	130	-242.1%	-4093.5%	0.5
Ethene	0.022	220	1.1	89	170	140	140	180	210	-18990.9%	-954445.5%	NA
Freon 113	14	13	<5	<2	<0.5	<0.17	<0.17	<0.34	<0.34	NA	>97.6%	1200
S139A												
PCE	13	0.5	<5	<1	<10	<2	<10	<10	<5	NA	>61.5%	5
TCE	1200	6.4	17	1.2	<10	6.6 J	24 J	20 J	12 J	29.4%	*99%	5
cis-1,2-DCE	2,000	30	410	9	690	740	3,900	3,300	2,000	-387.8%	0.0%	6
Vinyl Chloride	13	38	310	140	660	480	610	570	580	-87.1%	-4361.5%	0.5
Ethene	0.021	96	72	1500	1,400	1,300	730	760	610	-747.2%	-2904661.9%	NA
Freon 113	220	2	17	1.1	<10	<3.4	<17	<17	<8.5	>50%	>96.1%	1200
S159A												
PCE	NA	NA	<5	<5	<10	<0.4	<0.1	<0.1	<0.1	NA	NA	5
TCE	NA	NA	140	40	<10	1.6 J	0.52	0.37 J	0.33 J	99.8%	NA	5
cis-1,2-DCE	NA	NA	580	620	480	210	2.3	1.1	1.5	99.7%	NA	6
Vinyl Chloride	NA	NA	5.3	37	50	41	0.82	0.62	<0.18	96.6%	NA	0.5
Ethene	NA	NA	2.4	5.8	33	100	19	12	3.9	-62.5%	NA	NA
Freon 113	NA	NA	6.9	6.8	<10	<0.68	<0.17	<0.17	<0.17	>97.5%	NA	1200

Notes:
NA - Not Applicable
* - Percent Reduction Approx.
> - Min Reduction
< - Non-Detect

Result Qualifiers:
J - Estimated
E - Exceeds calibration range
H - Exceeds Holding time
Result units are micrograms per liter.

TABLE 9
ANALYTICAL RESULTS SUMMARY FOR EVALUATION OF KEY DATA
OCTOBER 2016 – NOVEMBER 2021
SIGNETICS SITE

	Phase I Results		Phase II Monitoring Events							% Reductions & Action Levels		
	Phase I Baseline 19–20 Oct. 2016	Phase I Quarter 4 15–16 Nov. 2017	14–16 Sep. 2020 (Baseline Monitoring)	15–18 Dec. 2020 (Month 1 / 30 Days)	18–20 Jan. 2021 (Month 2/ 60 Days)	15–17 Feb. 2021 (Month 3/ 90 Days)	17–19 May 2021 (Quarter 2/ 180 days)	17–19 Aug. 2021 (Quarter 3/ 270 days)	8–10 Nov. 2021 (Quarter 4/ 360 days)	Phase II % Reduction	Overall % Reduction Phase I and II	Action Level (µg/L)
S141A												
PCE	10	25	<25	<25	<25	<2.5	0.85 H	2 J	1.1 J	NA	>89%	5
TCE	270	3,800	1,400	260	230	220	250 H	730	400	71.4%	-48.1%	5
cis-1,2-DCE	1,600	1,000	560	1,800	1,500	1,300	1,200 H	710	620	-10.7%	61.3%	6
Vinyl Chloride	350	25	25	140	260	210	150 H	120	100	-300.0%	71.4%	0.5
Ethene	1.1	0.93	8	150	580	400	670	450	190	-2305.1%	-17172.7%	NA
Freon 113	40	780	240	72	48	22	120 H	120	51	78.8%	-27.5%	1200
S143A												
PCE	8.3	7.1	<10	<25	<2.5	<0.1	0.11 J	0.22 J	<0.4	NA	>95.2%	5
TCE	320	210	840	<25	<2.5	1.3	5.4	3.4	9.7	98.8%	97.0%	5
cis-1,2-DCE	760	3900	590	1,800	21	4.3	15	1.8	24	95.9%	96.8%	6
Vinyl Chloride	8.3	230	<10	420	12	5.2	17	9.9	220	NA	-2550.6%	0.5
Ethene	NA	NA	<0.12	38	950	450	290	470	670	NA	NA	NA
Freon 113	33	29	11	<25	<2.5	<0.17	0.46 J	0.78	<0.68	>93.8%	>97.9%	1200
S160A												
PCE	NA	NA	<25	<10	<25	<2	<2	<2	<2	NA	NA	5
TCE	NA	NA	500	<10	<25	16	21	59	160	68.0%	NA	5
cis-1,2-DCE	NA	NA	1,600	1,300	1,400	1,100	1,200	680	840	47.5%	NA	6
Vinyl Chloride	NA	NA	300	77	78	69	97	71	95	68.3%	NA	0.5
Ethene	NA	NA	850	25	43	72	64	40	42	95.1%	NA	NA
Freon 113	NA	NA	<25	<10	<25	4.3 J	4.9 J	3.4	3.8 J	NA	NA	1200

Notes:
NA - Not Applicable
* - Percent Reduction Approx.
> - Min Reduction
< - Non-Detect

Result Qualifiers:
J - Estimated
E - Exceeds calibration range
H - Exceeds Holding time
Result units are micrograms per liter.

TABLE 9
ANALYTICAL RESULTS SUMMARY FOR EVALUATION OF KEY DATA
OCTOBER 2016 – NOVEMBER 2021
SIGNETICS SITE

	Phase I Results		Phase II Monitoring Events							% Reductions & Action Levels		
	Phase I Baseline 19-20 Oct. 2016	Phase I Quarter 4 15-16 Nov. 2017	14-16 Sep. 2020 (Baseline Monitoring)	15-18 Dec. 2020 (Month 1 / 30 Days)	18-20 Jan. 2021 (Month 2/ 60 Days)	15-17 Feb. 2021 (Month 3/ 90 Days)	17-19 May 2021 (Quarter 2/ 180 days)	17-19 Aug. 2021 (Quarter 3/ 270 days)	8-10 Nov. 2021 (Quarter 4/ 360 days)	Phase II % Reduction	Overall % Reduction Phase I and II	Action Level (µg/L)
S138A												
PCE	83	170	<250	<250	<250	<25	<2 H	<5	<10	NA	>88%	5
TCE	9,100	720	6800	250	250	25	16 H	88	10	99.9%	99.9%	5
cis-1,2-DCE	13,000	24,000	25,000	23,000	17,000	1,900	3,900 H	2,400	4,500	82.0%	65.4%	6
Vinyl Chloride	83	180	460	480	1,200	9,700	2900 H	990	2,000	-334.8%	-2309.6%	0.5
Ethene	0.41	520	740	1,400	860	1,100	2000	2,000	2,400	-224.3%	-585265.9%	NA
Freon 113	1,000	820	2,000	3,600	1,700	760	520 J	290	410	79.5%	59.0%	1200
S140A												
PCE	24	500	<1000	<500	<1300	<100	<40 H	<100	<200	NA	>-733.3%	5
TCE	52,000	16,000	15,000	<500	2,300	6,400	1600 H	110 J	<200	>98.7%	>99.6%	5
cis-1,2-DCE	27,000	52,000	50,000	44,000	57,000	48,000	55,000 H	48,000	53,000	-6.0%	-96.3%	6
Vinyl Chloride	32	500	<1000	3,300	2,400	1,600	1,700 H	2,600	2800	NA	-8650.0%	0.5
Ethene	0.77	46	580	1,800	1,700	1,400	1,100	1,600	2,000	-244.8%	-259640.3%	NA
Freon 113	4,400	2,000	<1000	980	1,300	740	740 H	660	630 J	NA	*85.7%	1200
S146A												
PCE	3.4	63	<50	<100	<200	<20	7.3 J, H	38	43 J	NA	*-1164.7%	5
TCE	420	540	5,700	350	200	890	910 H	5,000	4,100	28.1%	-876.2%	5
cis-1,2-DCE	890	6,800	4,200	8,500	11,000	7,500	7,700 H	5,900	12,000	-185.7%	-1248.3%	6
Vinyl Chloride	3.1	63	<50	340	230	540	1,100 H	49 J	75 J	NA	*-2319.4%	0.5
Ethene	0.07	4.2	220	150	140	100	110	120	180	18.2%	-257042.9%	NA
Freon 113	780	2,900	4,300	4,200	4,800	3,800	3,400 H	4,600	6,100	-41.9%	-682.1%	1200
S158A												
PCE	NA	NA	17	<250	<500	<50	<2 H	0.3 J	<10	>41.2%	NA	5
TCE	NA	NA	8,100 E	2,600	<500	<50	19 H	1.6	<10	*99.9%	NA	5
cis-1,2-DCE	NA	NA	5,700	22,000	22,000	21,000	650 H	44	1,200	78.9%	NA	6
Vinyl Chloride	NA	NA	24	<250	<500	310	4,100 H	130	5,100	-21150.0%	NA	0.5
Ethene	NA	NA	1	27	31	270	3,400	2,000	5,200	-399900.0%	NA	NA
Freon 113	NA	NA	1,500	2,900	1,100	690	350 H	79	860	42.7%	NA	1200

Notes:
NA - Not Applicable
* - Percent Reduction Approx.
> - Min Reduction
< - Non-Detect

Result Qualifiers:
J - Estimated
E - Exceeds calibration range
H - Exceeds Holding time
Result units are micrograms per liter.

TABLE 10
RESULTS SUMMARY FOR REDOX CONDITIONS EVALUTION
SEPTEMBER 2020 – NOVEMBER 2021
SIGNETICS SITE

	Units	14–16 Sep. 2020 Baseline	10–20 Nov. 2020 Injection	15–18 Dec. 2020 Month 1 (30 Days)	18–20 Jan. 2021 Month 2 (60 Days)	15–17 Feb. 2021 Month 3 (90 Days)	17–19 May 2021 Q2 (180 Days)	17–19 Aug. 2021 Q3 (270 Days)	8–10 Nov. 2021 Q4 (360 Days)
S137A									
TOC[1]	mg/L	1.5	520	110	85	19	4.7	4	4.7
Dissolved Oxygen[2]	mg/L	0.3	1.23	0.57	0.32	0.47	2.69	0.7	0.59
Nitrate as Nitrogen	mg/L	1.3 U	NS	0.25 U	0.25 U	0.1 U	0.1 U	0.5 U	0.5 U
Ferrous Iron	mg/L	0	3.5	2	4	2.5	4	4.5	5.5
Sulfate	mg/L	180	NS	1 U	1.6	0.9	4.4	25 J	46
Carbon Dioxide	mg/L	31.2	NS	23	26.9	60.4	39.3	124	155
Hydrogen	nM	1.6 J	NS	15	4.5	2.2	2.2	15	0.9 J
Dissolved Methane	mg/L	1.5	NS	4.3	12	18	9.1	9.5	9.2
Methane well head	ppm	0	210	530	50250	50250	24000	9600	670
DHC[3]	cells/mL	6.2E+2	NS	NS	NS	3.4E+4	NS	8.0E+4	1.9E+4
S139A									
TOC[1]	mg/L	2.0	190	94	68	22	5.4	4.9	3.2
Dissolved Oxygen[2]	mg/L	0.3	1.13	0.16	0.22	0.48	2.27	0.75	0.66
Nitrate as Nitrogen	mg/L	1.3 U	NS	1.3 U	1.3 U	0.88 U	0.5 U	0.5 U	0.5 U
Ferrous Iron	mg/L	2	4	0.5	0	1	4.5	5.5	4
Sulfate	mg/L	190	NS	5 U	8.8	9	81	57	120
Carbon Dioxide	mg/L	78.7	NS	97	99.2	NS	108	6.83	121
Hydrogen	nM	2.2	NS	3.1	1.2 J	1.2 J	4.2	0.96 J	1.2 J
Dissolved Methane	mg/L	8.1	NS	8.7	14	13	7.6	6.8	7.6
Methane well head	ppm	0	1150	2050	50250	50250	16500	9400	2000
DHC[3]	cells/mL	5.8E+2	NS	NS	NS	3.4E+5	NS	4.4E+4	2.4E+4
S159A									
TOC[1]	mg/L	1.8	580 ^	410	510	460	83	54	19
Dissolved Oxygen[2]	mg/L	0.3	2.18	0.38	0.34	0.54	2.43	0.6	0.84
Nitrate as Nitrogen	mg/L	1.3 U	NS	1.3 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Ferrous Iron	mg/L	0	0.5	4.5	2.5	3	3.5	4	1
Sulfate	mg/L	180	NS	6.8	5 U	2 J	1.8 U	1.8 U	1.8 U
Carbon Dioxide	mg/L	25.8	NS	284	347	285	191	265	167
Hydrogen	nM	2	NS	0.83 J	2.1 J	3.6	4.6	3	1.9 J
Dissolved Methane	mg/L	0.2	NS	0.19	3.4	8.5	7.4	6.5	2.9
Methane well head	ppm	15	155	230	4300	50250	100500	50250	50250
DHC[3]	cells/mL	1.4E+0	NS	NS	NS	1.1E+5	NS	1.9E+3	2.0E+3

		Low-TCE Wells Statistics (S137A, S139A, S159A)																							
		MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX
TOC[1]	mg/L	1.5	1.8	2	190	520	580	94	110	410	68	85	510	19	22	460	4.7	5.4	83	4	4.9	54	3.2	4.7	19
Dissolved Oxygen[2]	mg/L	0.3	0.3	0.3	1.13	1.23	2.18	0.16	0.38	0.57	0.22	0.32	0.34	0.47	0.48	0.54	2.27	2.43	2.69	0.6	0.7	0.75	0.59	0.66	0.84
Nitrate as Nitrogen	mg/L	1.3	1.3	1.3	0	NA	0	0.25	1.3	1.3	0.25	1.3	1.3	0.1	0.5	0.88	0.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ferrous Iron	mg/L	0	0	2	0.5	3.5	4	0.5	2	4.5	0	2.5	4	1	2.5	3	3.5	4	4.5	4	4.5	5.5	1	4	5.5
Sulfate	mg/L	180	180	190	0	NA	0	1	5	6.8	1.6	5	8.8	0.9	2	9	1.8	4.4	81	1.8	25	57	1.8	46	120
Carbon Dioxide	mg/L	25.8	31.2	78.7	0	NA	0	23	97	284	26.9	99.2	347	60.4	172.7	285	39.3	108	191	6.83	124	265	121	155	167
Hydrogen	nM	1.6	2	2.2	0	NA	0	0.83	3.1	15	1.2	2.1	4.5	1.2	2.2	3.6	2.2	4.2	4.6	0.96	3	15	0.9	1.2	1.9
Dissolved Methane	mg/L	0.2	1.5	8.1	0	NA	0	0.19	4.3	8.7	3.4	12	14	8.5	13	18	7.4	7.6	9.1	6.5	6.8	9.5	2.9	7.6	9.2
Methane well head	ppm	0	0	15	155	210	1150	230	530	2050	4300	50250	50250	50250	50250	50250	16500	24000	100500	9400	9600	50250	670	2000	50250
DHC[3]	cells/mL	1.4E+0	5.8E+2	6.2E+2	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.4E+4	1.1E+5	3.4E+5	NA	NA	NA	1.9E+3	4.4E+4	8.0E+4	2.0E+3	1.9E+4	2.4E+4

TABLE 10
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SEPTEMBER 2020 – NOVEMBER 2021
SIGNETICS SITE

	Units	14–16 Sep. 2020 Baseline	10–20 Nov. 2020 Injection	15–18 Dec. 2020 Month 1 (30 Days)	18–20 Jan. 2021 Month 2 (60 Days)	15–17 Feb. 2021 Month 3 (90 Days)	17–19 May 2021 Q2 (180 Days)	17–19 Aug. 2021 Q3 (270 Days)	8–10 Nov. 2021 Q4 (360 Days)
S141A									
TOC[1]	mg/L	1.7	40 U	9.7	12	9.4	7.1	4.7	4.2
Dissolved Oxygen[2]	mg/L	0.3	0.97	0.53	0.45	0.49	2.07	0.65	0.65
Nitrate as Nitrogen	mg/L	1.3 U	NS	1.3 U	1.3 U	1.3 U	0.5 U	0.5 U	0.5 U
Ferrous Iron	mg/L	0	0	5	5.5	2.5	5	3.5	2.5
Sulfate	mg/L	150	NS	89	57	61	32	27	31
Carbon Dioxide	mg/L	61.3	NS	154	204	162	245	193	219
Hydrogen	nM	1.5 J	NS	7.3	2	0.75 J	4.4	0.95 J	1.4 J
Dissolved Methane	mg/L	0.44	NS	1	3	3.2	5.6	7.6	8.4
Methane well head	ppm	0	530	320	15	165	180	0	240
DHC[3]	cells/mL	6.5E+0	NS	NS	NS	5.9E+4	NS	6.8E+4	1.0E+4
S143A									
TOC[1]	mg/L	1.3	56 B,^	97	110	71	4.1	2.9	2.6
Dissolved Oxygen[2]	mg/L	0.7	0.84	0.25	0.33	0.47	2.7	0.72	0.6
Nitrate as Nitrogen	mg/L	1.3 U	NS	1.3 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Ferrous Iron	mg/L	0	1	3	5	4	4	3.5	2
Sulfate	mg/L	160	NS	5 U	5 U	1.8 U	54	44	85
Carbon Dioxide	mg/L	28.7	NS	145	14.1	105	90.4	178	140
Hydrogen	nM	1.6 J	NS	3.9	8.2	2.8	4	1 J	1 J
Dissolved Methane	mg/L	0.0035 J	NS	0.37	7.3	9.7	8	9	12
Methane well head	ppm	0	115	105	1700	15000	22250	2900	85
DHC[3]	cells/mL	4.4E+0	NS	NS	NS	6.5E+4	NS	6.2E+3	1.7E+4
S160A									
TOC[1]	mg/L	1 U	57	6.7	4.2	4.4	4.4	3.2	3.5
Dissolved Oxygen[2]	mg/L	0.3	1.98	0.4	0.43	0.51	2.36	0.75	0.68
Nitrate as Nitrogen	mg/L	1.3 U	NS	1.3 U	1.3 U	0.88 U	0.5 U	0.5 U	0.5 U
Ferrous Iron	mg/L	0	1.5	4	4	3	2.5	4	2.5
Sulfate	mg/L	110	NS	130	160	160	130	96	95
Carbon Dioxide	mg/L	71.4	NS	75.9	132	123	178	188	271
Hydrogen	nM	1.7 J	NS	1.6 J	0.92 J	0.92 J	2.6	1 J	1.2 J
Dissolved Methane	mg/L	4	NS	1	2.6	2.2	4.2	6.9	9.2
Methane well head	ppm	120	3000	600	0	870	0	0	0
DHC[3]	cells/mL	2.7E+1	NS	NS	NS	1.0E+4	NS	6.0E+3	4.7E+3
Mid-range TCE Wells Statistics (S141A, S143A, S160A)									

		MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX
TOC[1]	mg/L	1	1.3	1.7	40	56	57	6.7	9.7	97	4.2	12	110	4.4	9.4	71	4.1	4.4	7.1	2.9	3.2	4.7	2.6	3.5	4.2
Dissolved Oxygen[2]	mg/L	0.3	0.3	0.7	0.84	0.97	1.98	0.25	0.4	0.53	0.33	0.43	0.45	0.47	0.49	0.51	2.07	2.36	2.7	0.65	0.72	0.75	0.6	0.65	0.68
Nitrate as Nitrogen	mg/L	1.3	1.3	1.3	0	NA	0	1.3	1.3	1.3	1.3	1.3	1.3	0.5	0.88	1.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ferrous Iron	mg/L	0	0	0	0	1	1.5	3	4	5	4	5	5.5	2.5	3	4	2.5	4	5	3.5	3.5	4	2	2.5	2.5
Sulfate	mg/L	110	150	160	0	NA	0	5	89	130	5	57	160	1.8	61	160	32	54	130	27	44	96	31	85	95
Carbon Dioxide	mg/L	28.7	61.3	71.4	0	NA	0	75.9	145	154	14.1	132	204	105	123	162	90.4	178	245	178	188	193	140	219	271
Hydrogen	nM	1.5	1.6	1.7	0	NA	0	1.6	3.9	7.3	0.92	2	8.2	0.75	0.92	2.8	2.6	4	4.4	0.95	1	1	1	1.2	1.4
Dissolved Methane	mg/L	0.0035	0.44	4	0	NA	0	0.37	1	1	2.6	3	7.3	2.2	3.2	9.7	4.2	5.6	8	6.9	7.6	9	8.4	9.2	12
Methane well head	ppm	0	0.003	120	115	530	3000	105	320	600	0	15	1700	165	870	15000	0	180	22250	0	0	2900	0	85	240
DHC[3]	cells/mL	4.4E+0	6.5E+0	2.7E+1	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0E+4	5.9E+4	6.5E+4	NA	NA	NA	6.0E+3	6.2E+3	6.8E+4	4.7E+3	1.0E+4	1.7E+4

TABLE 10
RESULTS SUMMARY FOR REDOX CONDITIONS EVALUTION
SEPTEMBER 2020 – NOVEMBER 2021
SIGNETICS SITE

	Units	14–16 Sep. 2020 Baseline	10–20 Nov. 2020 Injection	15–18 Dec. 2020 Month 1 (30 Days)	18–20 Jan. 2021 Month 2 (60 Days)	15–17 Feb. 2021 Month 3 (90 Days)	17–19 May 2021 Q2 (180 Days)	17–19 Aug. 2021 Q3 (270 Days)	8–10 Nov. 2021 Q4 (360 Days)
S138A									
TOC[1]	mg/L	2.3	490	94	74	43	40	41	18
Dissolved Oxygen[2]	mg/L	0.2	0.78	0.25	0.23	0.41	1.92	0.55	0.61
Nitrate as Nitrogen	mg/L	0.25 U	NS	0.1 U	1.3 U	0.024 U	0.1 U	0.5 U	0.5 U
Ferrous Iron	mg/L	1.5	3	1	0	0.5	1	1	0.5
Sulfate	mg/L	160	NS	1	5 U	1.4	2.3	4.5 J	1.9 J
Carbon Dioxide	mg/L	20	NS	102	5.62	44.7	56	85.1	84.7
Hydrogen	nM	0.61 J	NS	210	59	10	3.9	2	2.5
Dissolved Methane	mg/L	0.56	NS	3.4	2.6	1.6	4.5	6.3	5.6
Methane well head	ppm	0	440	230	22250	4400	92500	34000	11250
DHC[3]	cells/mL	4.7E+3	NS	NS	NS	4.2E+5	NS	7.4E+5	1.2E+6
S140A									
TOC[1]	mg/L	1.9	120	45 F1	3.5	1.2	2.3	2.4	2.5
Dissolved Oxygen[2]	mg/L	0.2	1.15	0.12	0.27	0.37	1.94	0.62	0.7
Nitrate as Nitrogen	mg/L	1.3 U	NS	0.1 U	1.3 U	0.024 U	0.5 U	0.5 U	0.5 U
Ferrous Iron	mg/L	1	2.5	0.5	1	1.5	1.5	1	0.5
Sulfate	mg/L	170	NS	73	130	150	140	94	79
Carbon Dioxide	mg/L	22.8	NS	60.6	30.9	29.4	27	30.8	40.1
Hydrogen	nM	0.52 J	NS	0.93 J	0.71 J	5.4	4.6	1 J	1.4 J
Dissolved Methane	mg/L	0.25	NS	1.6	0.98	0.88	0.52	0.97	0.89
Methane well head	ppm	195	440	4500	2900	1600	1300	2550	2800
DHC[3]	cells/mL	3.0E+1	NS	NS	NS	1.7E+5	NS	1.8E+5	2.5E+5
S146A									
TOC[1]	mg/L	1 U	170	110	43	33	2.5	1.2	0.86 J
Dissolved Oxygen[2]	mg/L	0.3	1.23	0.15	0.27	0.40	1.97	0.61	0.69
Nitrate as Nitrogen	mg/L	0.25 U	NS	0.25 U	0.25 U	0.88 U	0.1 U	0.5 U	0.5 U
Ferrous Iron	mg/L	0.5	3.5	1	0.5	2.5	0.5	1.5	1.5
Sulfate	mg/L	110	NS	4.3	39	61	77	110	110
Carbon Dioxide	mg/L	22.6	NS	45	2.81	28.9	22.9	20.9	28.8
Hydrogen	nM	1.8 J	NS	120	21	2.6	4	0.86 J	1.4 J
Dissolved Methane	mg/L	1.3	NS	1.1	0.5	0.26	0.19	0.25	0.42
Methane well head	ppm	190	540	470	540	1250	500	115	0
DHC[3]	cells/mL	3.4E+2	NS	NS	NS	1.7E+4		7.4E+4	1.6E+4
S158A									
TOC[1]	mg/L	2.4	240	120	130	130	150	210	130
Dissolved Oxygen[2]	mg/L	0.3	1.64	0.15	0.27	0.40	2.01	0.69	0.66
Nitrate as Nitrogen	mg/L	1.3 U	NS	1.3 U	1.3 U	0.024 U	0.5 U	0.5 U	0.5 U
Ferrous Iron	mg/L	0	2	3	4	5	7	5.5	2
Sulfate	mg/L	180	NS	40	34	2.3	3.5 J	1.8 U	1.9 J
Carbon Dioxide	mg/L	24.8	NS	110	11.5	136	211	338	399
Hydrogen	nM	53	NS	64	18	9.6	14	5	5.2
Dissolved Methane	mg/L	0.015	NS	0.015	0.036	0.46	3.3	6.1	3.7
Methane well head	ppm	0	410	400	15	0	410	13250	0
DHC[3]	cells/mL	2.2E+0	NS	NS	NS	2.0E+4	NS	5.7E+5	5.1E+5

TABLE 10
RESULTS SUMMARY FOR REDOX CONDITIONS EVALUTION
SEPTEMBER 2020 - NOVEMBER 2021
SIGNETICS SITE

	Units	14-16 Sep. 2020 Baseline			10-20 Nov. 2020 Injection			15-18 Dec. 2020 Month 1 (30 Days)			18-20 Jan. 2021 Month 2 (60 Days)			15-17 Feb. 2021 Month 3 (90 Days)			17-19 May 2021 Q2 (180 Days)			17-19 Aug. 2021 Q3 (270 Days)			8-10 Nov. 2021 Q4 (360 Days)		
High-TCE wells Statistics (S138A, S140A, S146A, S158A)																									
		MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX
TOC[1]	mg/L	1	2.1	2.4	120	205	490	45	102	120	3.5	58.5	130	1.2	38	130	2.3	21.25	150	1.2	21.7	210	0.86	10.25	130
Dissolved Oxygen[2]	mg/L	0.2	0.25	0.3	0.78	1.19	1.64	0.12	0.15	0.25	0.23	0.27	0.27	0.37	0.4	0.41	1.92	1.955	2.01	0.55	0.615	0.69	0.61	0.675	0.7
Nitrate as Nitrogen	mg/L	0.25	0.775	1.3	0	NA	0	0.1	0.175	1.3	0.25	1.3	1.3	0.024	0.024	0.88	0.1	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ferrous Iron	mg/L	0	0.75	1.5	2	2.75	3.5	0.5	1	3	0	0.75	4	0.5	2	5	0.5	1.25	7	1	1.25	5.5	0.5	1	2
Sulfate	mg/L	110	165	180	0	NA	0	1	22.15	73	5	36.5	130	1.4	31.65	150	2.3	40.25	140	1.8	49.25	110	1.9	40.45	110
Carbon Dioxide	mg/L	20	22.7	24.8	0	NA	0	45	81.3	110	2.81	8.56	30.9	28.9	37.05	136	22.9	41.5	211	20.9	57.95	338	28.8	62.4	399
Hydrogen	nM	0.52	1.205	53	0	NA	0	0.93	92	210	0.71	19.5	59	2.6	7.5	10	3.9	4.3	14	0.86	1.5	5	1.4	1.95	5.2
Dissolved Methane	mg/L	0.015	0.41	1.3	0	NA	0	0.015	1.35	3.4	0.04	0.74	2.6	0.26	0.67	1.6	0.19	1.91	4.5	0.25	3.54	6.3	0.42	2.30	5.6
Methane well head	ppm	0	95	195	410	440.0	540	230	435	4500	15	1720	22250	0	1425	4400	410	900	92500	115	7900	34000	0	1400	11250
DHC[3]	cells/mL	2.2E+0	1.8E+2	4.7E+3	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.7E+4	9.3E+4	4.2E+5	NA	NA	NA	7.4E+4	3.8E+5	7.4E+5	1.6E+4	3.8E+5	1.2E+6
Summary: All Reactive Zone Wells Statistics																									
		MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX
TOC[1]	mg/L	1	1.75	2.4	40	180	580	6.7	95.5	410	3.5	71	510	1.2	27.5	460	2.3	5.05	150	1.2	4.35	210	0.86	3.85	130
Dissolved Oxygen[2]	mg/L	0.2	0.3	0.7	0.78	1.19	2.18	0.12	0.25	0.57	0.22	0.295	0.45	0.37	0.47	0.54	1.92	2.17	2.7	0.55	0.67	0.75	0.59	0.66	0.84
Nitrate as Nitrogen	mg/L	0.25	1.3	1.3	0	NA	0	0.1	1.3	1.3	0.25	1.3	1.3	0.024	0.5	1.3	0.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ferrous Iron	mg/L	0	0	2	0	2.25	4	0.5	2.5	5	0	3.25	5.5	0.5	2.5	5	0.5	3.75	7	1	3.75	5.5	0.5	2	5.5
Sulfate	mg/L	110	165	190	0	NA	0	1	5.9	130	1.6	21.4	160	0.9	5.65	160	1.8	43	140	1.8	35.5	110	1.8	62.5	120
Carbon Dioxide	mg/L	20	27	78.7	0	NA	0	23	99.5	284	2.81	28.9	347	28.9	105	285	22.9	99.2	245	6.83	151	338	28.8	147.5	399
Hydrogen	nM	0.52	1.65	53	0	NA	0	0.83	5.6	210	0.71	3.3	59	0.75	2.7	10	2.2	4.1	14	0.86	1	15	0.9	1.4	5.2
Dissolved Methane	mg/L	0.0035	0.5	8.1	0	NA	0	0.015	1.05	8.7	0.036	2.8	14	0.26	2.7	18	0.19	5.05	9.1	0.25	6.65	9.5	0.42	6.6	12
Methane well head	ppm	0	0.0015	195	115	440	3000	105	435	4500	0	2300	50250	0	3000	50250	0	8900	100500	0	6150	50250	0	455	50250
DHC[3]	cells/mL	1.4E+0	2.9E+1	4.7E+3	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0E+4	6.2E+4	4.2E+5	NA	NA	NA	1.9E+3	7.1E+4	7.4E+5	2.0E+3	1.8E+4	1.2E+6

Notes

1. Total Organic Carbon (TOC): Multiple samples collected for injection monitoring event; table reports the highest TOC result. Complete TOC results reported in Table 6 and Appendix H (figures H-1-0 through H-1-13).
2. Dissolved Oxygen result from 15-16 March 2021 reported instead of 15-18 February 2021 results.
3. Dechlorinating Bacteria Dehalococcoides spp. (DHC).
4. Not Sampled (NS).

Qualifiers:

U - Non-Detect
J - Result between maximum detection limit and limit of quantification
^ - Instrument related QC is outside acceptance limits
B - Compound was found in the blank sample

TABLE 11
SUMMARY OF KEY EAB PHASE II RESULTS BY WELL
SEPTEMBER 2020 – NOVEMBER 2021
SIGNETICS SITE

Performance Parameter		Monitoring Locations in Reactive Zone		
		S137A	S139A	S159A
Wells relative to injection points:		(~10 ft. d/g from SRS-SD injection 2)	(~10 ft. u/g from SRS-SD injection 7)	(10 ft. c/g from SRS-SD injection 4)
Radius of Influence (ROI) WL increase >0.5 ft desired (max WL increase in ft)		unknown	unknown	WL increase (12)
Delivery Techniques:		TDIP 84 gal SRS-SD, 3.5 L TSI-DC, 75 lbs NaHCO3, 4599 gal conditioned water 170 PSI	TDIP 84 gal SRS-SD, 3.5 L TSI-DC, 76.5 lbs NaHCO3, 4599 gal conditioned water 170 PSI	TDIP 84 gal SRS-SD, 3.5 L TSI-DC, 78 lbs NaHCO3, 4599 gal conditioned water 170 PSI
TOC Retention Time in days TOC > 20 mg/L (max observed TOC in mg/L)		Thru 15-17 Feb. 2021 90 days (520)	Thru 15-17 Feb. 2021 90 days (190)	Approx. 8-10 Nov. 2021 360 days (580)
Metals Increase desired (Sep 2020 baseline – Max – Nov 2021 Q4) in mg/L		Fe2+ increase (0-5.5-5.5)	Fe2+ increase (2-5.5-4.0)	Fe2+ increase (0-4.5-1)
Sulfate Sulfate < 20 mg/L desired (Sep 2020 baseline – Rebound– Nov 2021 Q4 in mg/L)		Decreased followed by rebound at 270 days (180 – 4.4 – 25 J)	Decreased followed by rebound at 180 days (190 – 9 – 81)	Decrease (180–<1.8)
Hydrogen Approx. Production period (Hydrogen > 2 nM desired)		Dec 2020 – Aug 2021 (30 – 270 days)	Sep 2020 – May 2021 (Baseline – 180 days)	Jan 2021 – Nov 2021 (60 – 360 days)
Methane Production period (Methane > 1.0 mg/L desired)		Sep 2020 – Nov 2021 (Baseline – 360 days)	Sep 2020 – Nov 2021 (Baseline – 360 days)	Jan 2021 – Nov 2021 (60 – 360 days)
DHC Microbe population increase DHC > 1 x 10^4 cells/mL desired (Sep 2020 baseline – Nov 2021 Q4 in cells/mL)		Moderate 6.21 x 10^2 – 1.85 x10^4	Moderate 5.82 x 10^2 – 2.36 x10^4	Low 1.4 x 10^0– 2.36 x10^3
VOCs (ug/L) **Degradation**: Order of magnitude higher than background desired, followed by decline. (Sep 2020 baseline – Max – Nov 2021 Q4 in ug/L) (% reduction) **Color Code**: *Low – parameter requires attention* *Medium – stall and/or rebound in degradation; or only slight improvement* *High – undergoing dechlorination, or improved and/or acceptable concentration*	TCE	TCE reduction (17–1.2) (93%)	TCE reduction followed by rebound at 60 days (17– 1.2–12.8 (29.4%)	TCE reduction (140–.33 J) (99.8%)
	cis-DCE	cis-DCE decrease followed by rebound at 180 days (580–4–25) (96%)	cis-DCE decrease followed by rebound at 60 days (410–9–2000) (–388%)	cis-DCE reduction (580–1.5) (99.7%)
	VC	VC decrease followed by rebound at 360 days (38–23–130)	VC decrease followed by rebound at 60 days (310–140–580)	VC reduction (5.3–<.18) (96.6%)
	Ethene	Ethene increase (1.1–210–210)	Ethene increase (72–1500–610)	Ethene increase (2.4–100–3.0)
	Freon 113	Freon 113 no change, but low baseline (<5 – <0.34)	Freon 113 reduction (17–<8.5)	Freon 113 reduction (16.9–<17)
	PCE	PCE at acceptable concentration (<5 – <0.2)	PCE at acceptable concentration (<5 – <5)	PCE at acceptable concentration (<5 – < 0.1)

See notes on page 3.

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TABLE 11
SUMMARY OF KEY EAB PHASE II RESULTS BY WELL
SEPTEMBER 2020 – NOVEMBER 2021
SIGNETICS SITE

Performance Parameter		Monitoring Locations in Reactive Zone		
		S141A	S143A	S160A
Wells relative to injection points:		(~20 ft. d/g from SRS-SD injection 7)	(12 ft. c/g from SRS-SD injection 10)	(14 ft. d/g from SRS-SD injection 7)
Radius of Influence (ROI) WL increase >0.5 ft desired (max WL increase in ft)		WL increase (3.5)	WL increase (1.25)	WL increase (8)
Delivery Techniques:		TDIP 84 gal SRS-SD, 3.5 L TSI-DC, 76.5 lbs NaHCO3, 4599 gal conditioned water 170 PSI	TDIP 84 gal SRS-SD, 3.5 L TSI-DC, 75 lbs NaHCO3, 4599 gal conditioned water 170 PSI	TDIP 84 gal SRS-SD, 3.5 L TSI-DC, 76.5 lbs NaHCO3, 4599 gal conditioned water 170 PSI
TOC Retention Time in days TOC > 20 mg/L (max observed TOC in mg/L)		Nov. 2020 <7 days (<40)	Bkd 17-19 May 2021 180 days (110)	Nov. 2020 <7 days (57)
Metals Increase desired (Sep 2020 baseline – Max – Nov 2021 Q4) in mg/L		Fe2+ increase (0–5.5–2.5)	Fe2+ increase (0–5.0–2.0)	Fe2+ increase (0–4.0–2.5)
Sulfate Sulfate < 20 mg/L desired (Sep 2020 baseline – Rebound– Nov 2021 Q4 in mg/L)		Slight decrease (150 – 31)	Decreased followed by rebound at 180 days (160–<1.8 –85)	Slight decrease (110 – 95)
Hydrogen Approx. Production period (Hydrogen > 2 nM desired)		Dec 2020 – Jan 2021 (30 – 60 days)	Dec 2020 – May 2021 (30 – 180 days)	only during May 2021 (180 days)
Methane Production period (Methane > 1.0 mg/L desired)		Jan 2021 – Nov 2021 (60 – 360 days)	Jan 2021 – Nov 2021 (60 – 360 days)	Sep 2020 – Nov 2021 (Baseline – 360 days)
DHC Microbe population increase DHC > 1 x 10^4 cells/mL desired (Sep 2020 baseline – Nov 2021 Q4 in cells/mL)		Moderate 6.5 x 10^0– 1.00 x10^4	Moderate 4.4 x 10^0– 1.66 x10^4	Low 2.68 x 10^1– 4.66 x10^3
VOCs (ug/L) **Degradation**: Order of magnitude higher than background desired, followed by decline. (Sep 2020 baseline – Max – Nov 2021 Q4 in ug/L) (% reduction) **Color Code**: *Low – parameter requires attention* *Medium – stall and/or rebound in degradation; or only slight improvement* *High – undergoing dechlorination, or improved and/or acceptable concentration*	TCE	TCE reduction followed by rebound at 90 days (1400–220–400) (71.4%)	TCE reduction followed by rebound at180 days (840–1.3–9.7) (98.8%)	TCE reduction followed by rebound at 90 days (500–< 10–160) (68.0%)
	cis-DCE	cis-DCE increase (560–620) (–11.7%)	cis-DCE decrease followed by rebound at180 days (590–4.3–24) (95.9%)	cis-DCE decrease (1600–840) (47.5%)
	VC	VC increase (25–100)	VC decrease followed by rebound at 180 day (<10–5.2–220)	VC decrease (300–95) (68.3%)
	Ethene	Ethene increase (8–679–190)	Ethene increase (<0.12–950–670)	Ethene decrease (850 – 42)
	Freon 113	Freon 113 reduction (240–51) (78.8%)	Freon 113 reduction (11–<0.68)	Freon 113 no change, but low baseline (<25 – 3.8 J)
	PCE	PCE at acceptable concentration (<25 – 1.1 J)	PCE at acceptable concentration (< 10 – 0.4)	PCE at acceptable concentration (<25 – < 2)

See notes on page 3.

TABLE 11
SUMMARY OF KEY EAB PHASE II RESULTS BY WELL
SEPTEMBER 2020 – NOVEMBER 2021
SIGNETICS SITE

Performance Parameter		Monitoring Locations in Reactive Zone			
		S138A	S140A	S146A	S158A
Wells relative to injection points:		(9 ft. d/g from SRS-SD injection 5) (Phase I reactive zone)	(15 ft. d/g from SRS-SD injection 8) (Phase I reactive zone)	(21 ft. d/g from SRS-SD injection 3) (Phase I reactive zone)	(12 ft. d/g from SRS-SD injection 9)
Radius of Influence (ROI) WL increase >0.5 ft desired (max WL increase in ft)		Oscillating WL for first two hours, then WL increase (5 ft)	WL increase (2.5)	WL increase (2.5)	WL increase to 8 ft then decreased and stabilized at 1 ft.
Delivery Techniques:		TDIP 140 gal SRS-SD, 3.5 L TSI-DC, 78 lbs NaHCO3, 4599 gal conditioned water 170 PSI	PAIP 84 gal SRS-SD, 3.5 L TSI-DC, 75 lbs NaHCO3, 4599 gal conditioned water 150-170 PSI	PAIP 84 gal SRS-SD, 3.5 L TSI-DC, 75 lbs NaHCO3, 4599 gal conditioned water 70-100 PSI	TDIP 84 gal SRS-SD, 3.5 L TSI-DC, 116.3 lbs NaHCO3, 6898 gal conditioned water 170 PSI
TOC Retention Time in days TOC > 20 mg/L (max observed TOC in mg/L)		Approx. 8-10 Nov. 2021 360 days (490)	Thru 18-20 Jan. 2021 60 days (120)	Thru 17-19 May 2021 180 days (170)	Thru 8-10 Nov. 2021 360 days (240)
Metals Increase desired (Sep 2020 baseline – Max – Nov 2021 Q4) in mg/L		Fe2+ decrease (1.5-3.0-0.5)	Fe2+ decrease (1.0-2.5-0.5)	Fe2+ slight increase (0.5-3.5-1.5)	Fe2+ increase (0-7-2.0)
Sulfate Sulfate < 20 mg/L desired (Sep 2020 baseline – Rebound– Nov 2021 Q4 in mg/L)		Decrease (160- 1.9 J)	Slight decrease (170 – 79)	Decreased followed by rebound at 60 days (110- 4.3 – 110)	Decrease (180-1.9 J)
Hydrogen Approx. Production period (Hydrogen > 2 nM desired)		Dec 2020 – Nov 2021 (30 – 360 days)	Feb 2021 – May 2021 (90 – 180 days)	Dec 2020 – May 2021 (30 – 180 days)	Sep 2020 – Nov 2021 (Baseline – 360 days)
Methane Production period (Methane > 1.0 mg/L desired)		Dec 2020 – Nov 2021 (30 – 360 days)	Only Dec 2020 (30 days)	Sep 2020 – Dec 2020 (Baseline – 30 days)	May 2021 – Nov 2021 (180 – 360 days)
DHC Microbe population increase DHC > 1 x 10^4 cells/mL desired (Sep 2020 baseline – Nov 2021 Q4 in cells/mL)		High 4.67 x 10^3 – 1.22 x10^6	High 3.02 x 10^1 – 2.52 x10^5	Moderate 3.38 x 10^2 – 1.58 x10^4	High 2.2 x 10^0– 5.10 x10^5
VOCs (ug/L) **Degradation**: Order of magnitude higher than background desired, followed by decline. (Sep 2020 baseline – Max – Nov 2021 Q4 in ug/L) (% reduction) **Color Code**: *Low – parameter requires attention* *Medium – stall and/or rebound in degradation; or only slight improvement* *High – undergoing dechlorination, or improved and/or acceptable concentration*	TCE	TCE reduction (6800-10) (99.8%)	TCE reduction (15,000-<200) (>98.7%)	TCE reduction followed by rebound at 90 days (5700- 200-4100) (28.2%)	TCE reduction (8100 E- 1.6-<10) (99.9%)
	cis-DCE	cis-DCE decrease followed by rebound at180 days (25,000-1,900-4500) (82.0%)	cis-DCE decrease followed by rebound at 60 days (50,000-44,000-53,000) (-6%)	cis-DCE increase (4200-12,000) (-186%)	cis-DCE decrease followed by rebound at 180 days (5700-44-1,200) (78.9%)
	VC	VC increase (460-2000) (-334.8%)	VC increase (<1000-2800)	VC increase (<50-75 J)	VC increase (<24-5100) (-21,150%)
	Ethene	Ethene increase (740-2400-2400)	Ethene increase (580-2600-2000)	Ethene decrease (220 – 180)	Ethene increase (1-5200-5200)
	Freon 113	Freon 113 reduction followed by rebound at360 days (2000-290-410)	Freon 113 no change, but elevated reporting limit(<1000 – 630J)	Freon 113 reduction followed by rebound at 270 days (4,300-3,400 H-6,100)	Freon 113 reduction followed by rebound at 360 days (1,500-79-860)
	PCE	PCE no change, but elevated reporting limit (<250 – <10)	PCE no change, but elevated reporting limit (<1000 – <200)	PCE no change, but elevated reporting limit (<50 – 43 J)	PCE reduction (17 – <10)

See notes on page 3.

Notes:

d/g	downgradient	L	liters
c/g	crossgradient	lbs	pounds
u/g	upgradient	NAHCO3	sodium bicarbonate
ft	feet	PSI	pounds per square inch
WL	water level	Q	quarter
TDIP	top-down injection probe	TCE	Trichloroethene
PAIP	pressure activated injection probe	cis-DCE	cis-1,2-dichloroethene
gal	gallons	VC	vinyl chloride

ED_013761_00000157-00175

FIGURES

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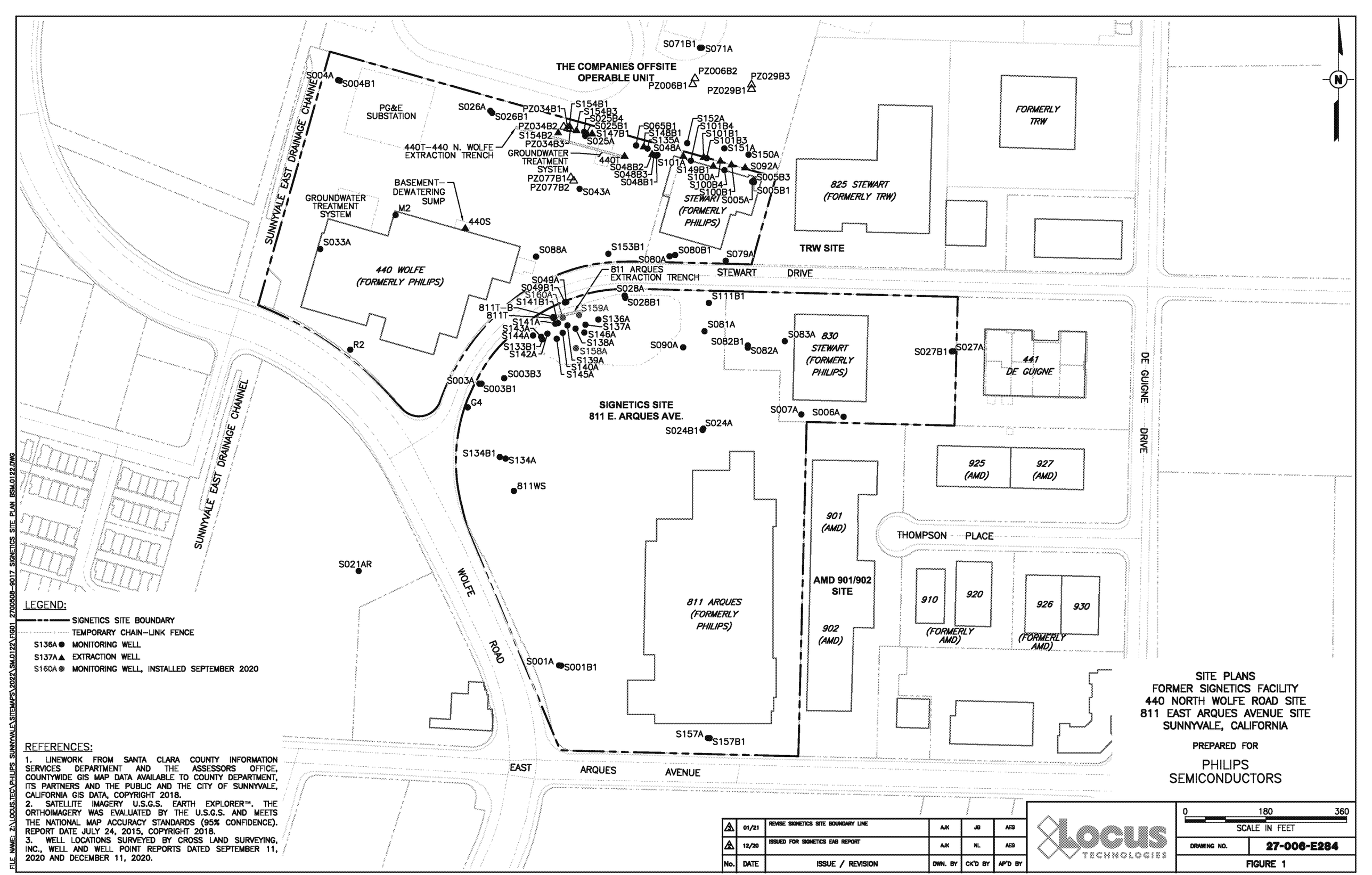


LEGEND:

- SIGNETICS SITE BOUNDARY
- TEMPORARY CHAIN–LINK FENCE
- S136A ● MONITORING WELL
- S137A ▲ EXTRACTION WELL
- S160A ◉ MONITORING WELL, INSTALLED SEPTEMBER 2020

REFERENCES:

1. LINEWORK FROM SANTA CLARA COUNTY INFORMATION SERVICES DEPARTMENT AND THE ASSESSORS OFFICE, COUNTYWIDE GIS MAP DATA AVAILABLE TO COUNTY DEPARTMENT, ITS PARTNERS AND THE PUBLIC AND THE CITY OF SUNNYVALE, CALIFORNIA GIS DATA, COPYRIGHT 2018.
2. SATELLITE IMAGERY U.S.G.S. EARTH EXPLORER™. THE ORTHOIMAGERY WAS EVALUATED BY THE U.S.G.S. AND MEETS THE NATIONAL MAP ACCURACY STANDARDS (95% CONFIDENCE). REPORT DATE JULY 24, 2015, COPYRIGHT 2018.
3. WELL LOCATIONS SURVEYED BY CROSS LAND SURVEYING, INC., WELL AND WELL POINT REPORTS DATED SEPTEMBER 11, 2020 AND DECEMBER 11, 2020.

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
2	01/21	REVISE SIGNETICS SITE BOUNDARY LINE	AJK	JG	AEG
1	12/20	ISSUED FOR SIGNETICS EAB REPORT	AJK	NL	AEG

SITE PLANS
FORMER SIGNETICS FACILITY
440 NORTH WOLFE ROAD SITE
811 EAST ARQUES AVENUE SITE
SUNNYVALE, CALIFORNIA

PREPARED FOR

PHILIPS SEMICONDUCTORS

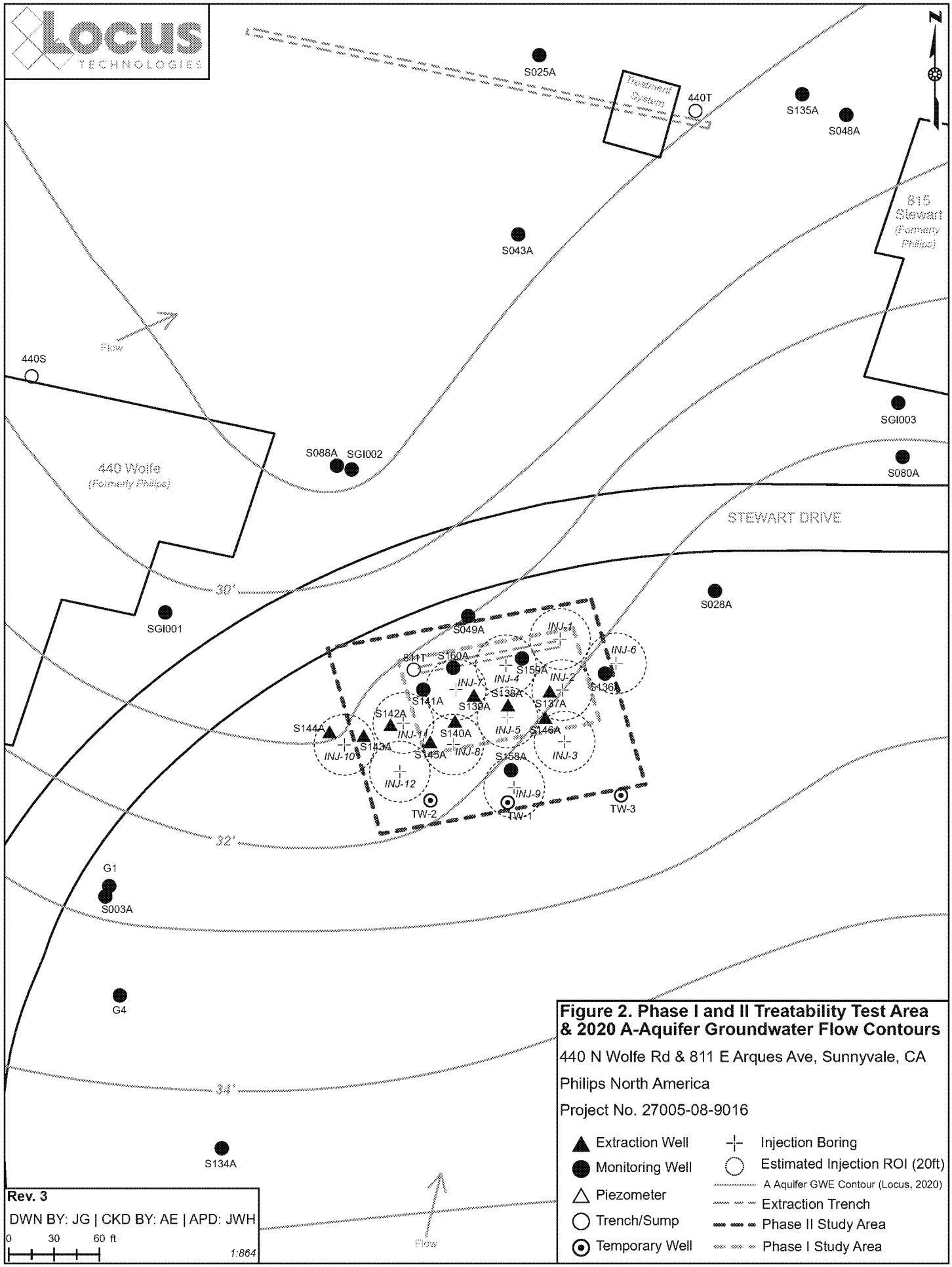
LOCUS TECHNOLOGIES

0 180 360
SCALE IN FEET

DRAWING NO. 27-006-E284

FIGURE 1

FILE NAME: Z:\LOCUS\TEC\PHILIPS SUNNYVALE\SITEMAPS\2022\SM.0122\FIG01 2700508-9017 SIGNETICS SITE PLAN RSM.0122.DWG


Locus TECHNOLOGIES
N
S025A
Treatment System
440T
S135A
S048A
815 Stewart (Formerly Philips)
S043A
Flow
440S
SGI003
S088A
SGI002
440 Wolfe (Formerly Philips)
S080A
STEWART DRIVE
30'
S028A
SGI001
S049A
INJ-1
INJ-6
811T
S160A
S159A
INJ-4
INJ-2
INJ-7
S136A
S141A
S138A
S137A
S130A
S142A
S144A
INJ-11
S140A
S146A
S143A
INJ-10
S145A
INJ-8
INJ-5
S158A
INJ-3
INJ-12
INJ-9
TW-2
TW-1
TW-3
32'
G1
S003A
G4
34'
S134A
Flow
Rev. 3
DWN BY: JG | CKD BY: AE | APD: JWH
0 30 60 ft
1:864
Figure 2. Phase I and II Treatability Test Area & 2020 A-Aquifer Groundwater Flow Contours
440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA
Philips North America
Project No. 27005-08-9016
Extraction Well
Monitoring Well
Piezometer
Trench/Sump
Temporary Well
Injection Boring
Estimated Injection ROI (20ft)
A Aquifer GWE Contour (Locus, 2020)
Extraction Trench
Phase II Study Area
Phase I Study Area

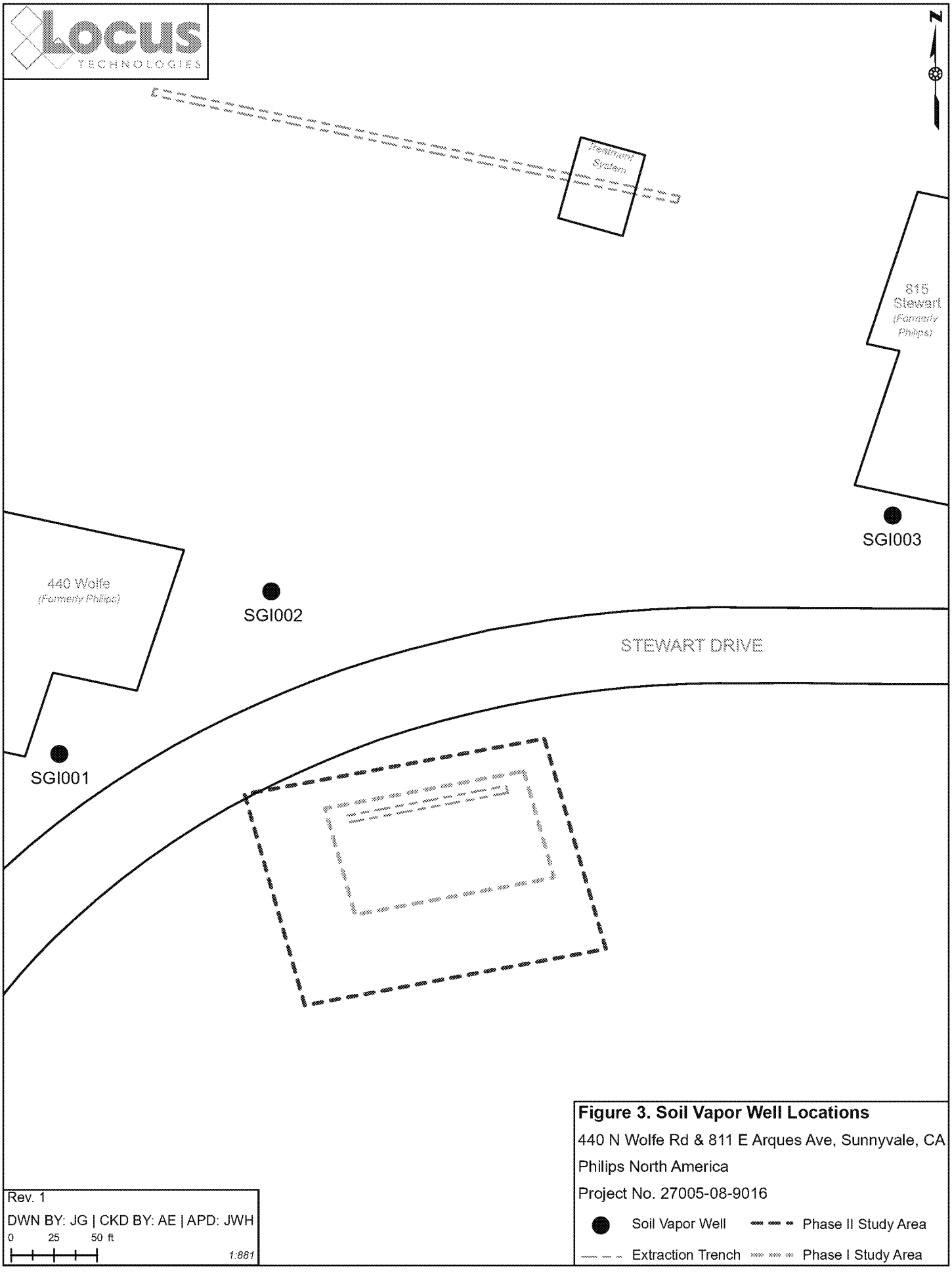
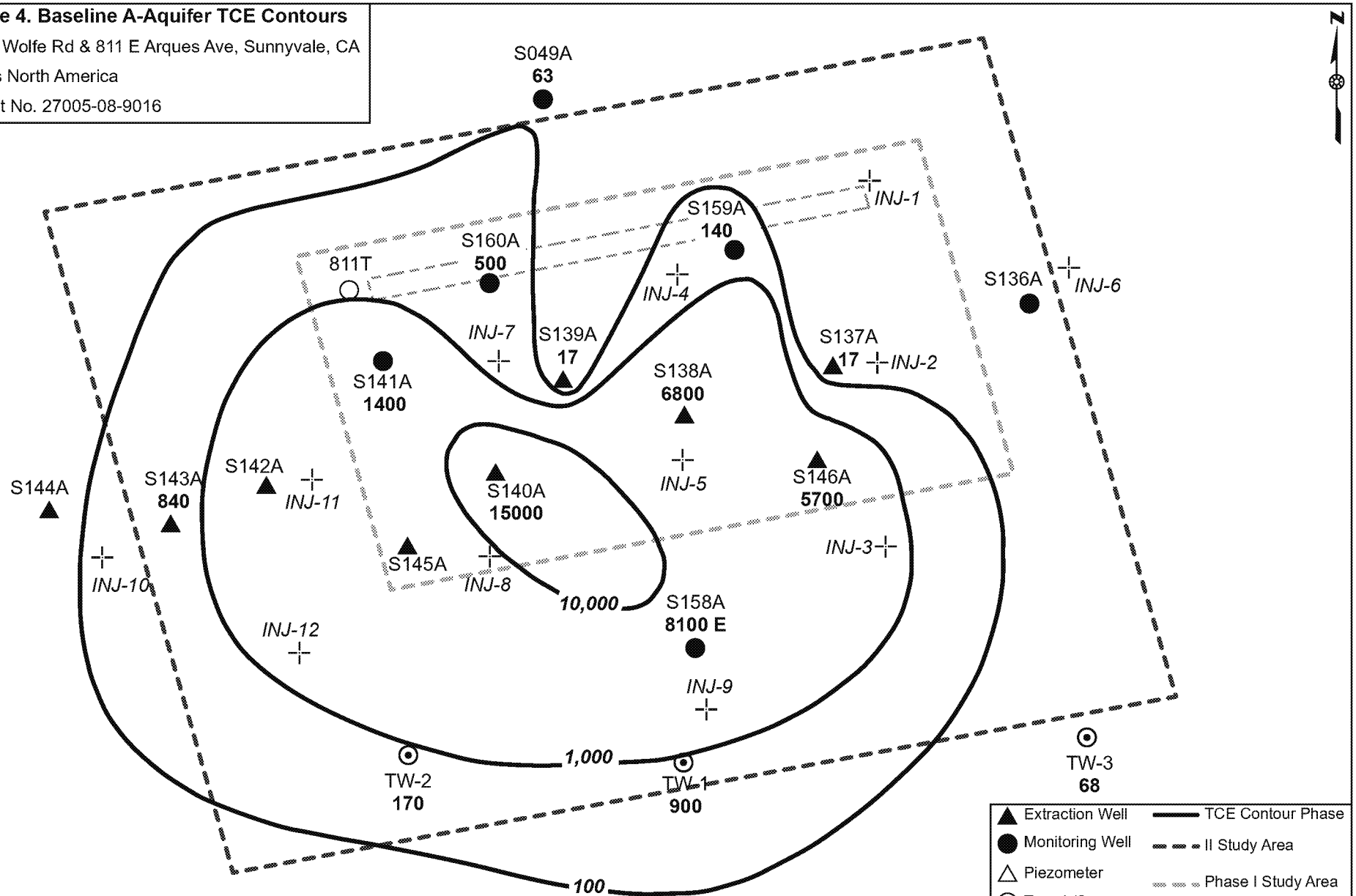

Locus
TECHNOLOGIES
N
Treatment System
815 Stewart
(Formerly Philips)
SGI003
440 Wolfe
(Formerly Philips)
SGI002
STEWART DRIVE
SGI001
Rev. 1
DWN BY: JG | CKD BY: AE | APD: JWH
0 25 50 ft
1:881
Figure 3. Soil Vapor Well Locations
440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA
Philips North America
Project No. 27005-08-9016
Soil Vapor Well
Phase II Study Area
Extraction Trench
Phase I Study Area

Figure 4. Baseline A-Aquifer TCE Contours

440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA

Philips North America

Project No. 27005-08-9016



NOTES:
TCE concentrations are shown in **bold**.
All results are reported in µg/L.
Baseline sampling occurred from 9/14/2020 to 9/16/2020.
TW grab samples were collected on 11/20/2020.
E - Result exceeded calibration range

Rev. 3

DWN BY: JG | CKD BY: AE | APD: JWH

0 25 ft

1:314

Locus TECHNOLOGIES

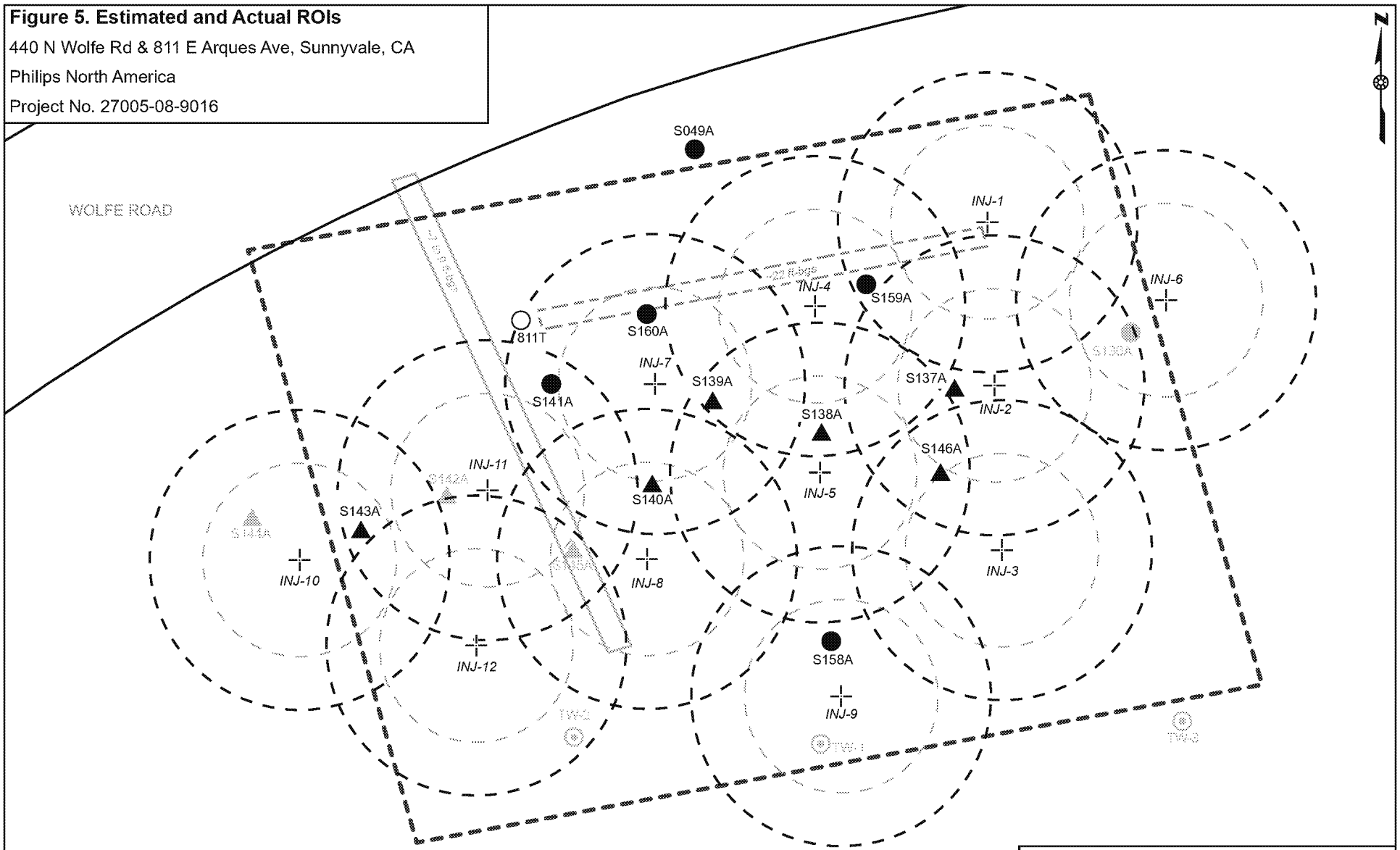
ED_013761_00000157-00180

Figure 5. Estimated and Actual ROIs

440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA

Philips North America

Project No. 27005-08-9016



NOTES:
Wells not included in Phase II sampling program are displayed in gray.
The average Phase II injection depth is 15-35 ft bgs.

Rev. 3

DWN BY: JG | CKD BY: AE | APD: JWH

0 25 ft

1:346

Locus TECHNOLOGIES

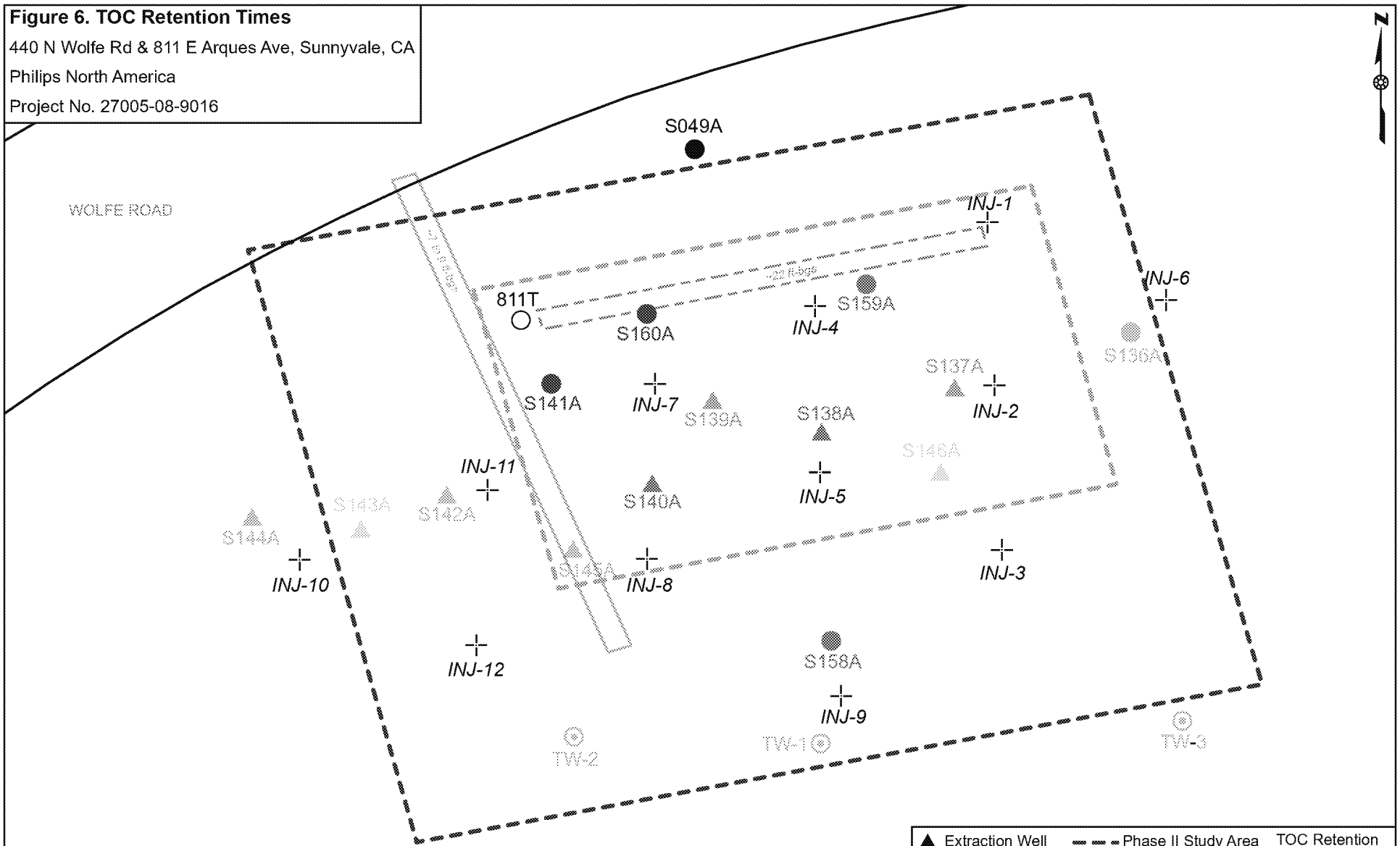
ED_013761_00000157-00181

Figure 6. TOC Retention Times

440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA

Philips North America

Project No. 27005-08-9016



NOTES:
TOC retention time defined as period of time above 20 mg/L.
The average Phase II injection depth is 15-35 ft bgs.
Wells not included in Phase II sampling program are displayed in gray.

Rev. 3

DWN BY: JG | CKD BY: AE | APD: JWH

0 25 ft

1:346

LOCUS TECHNOLOGIES

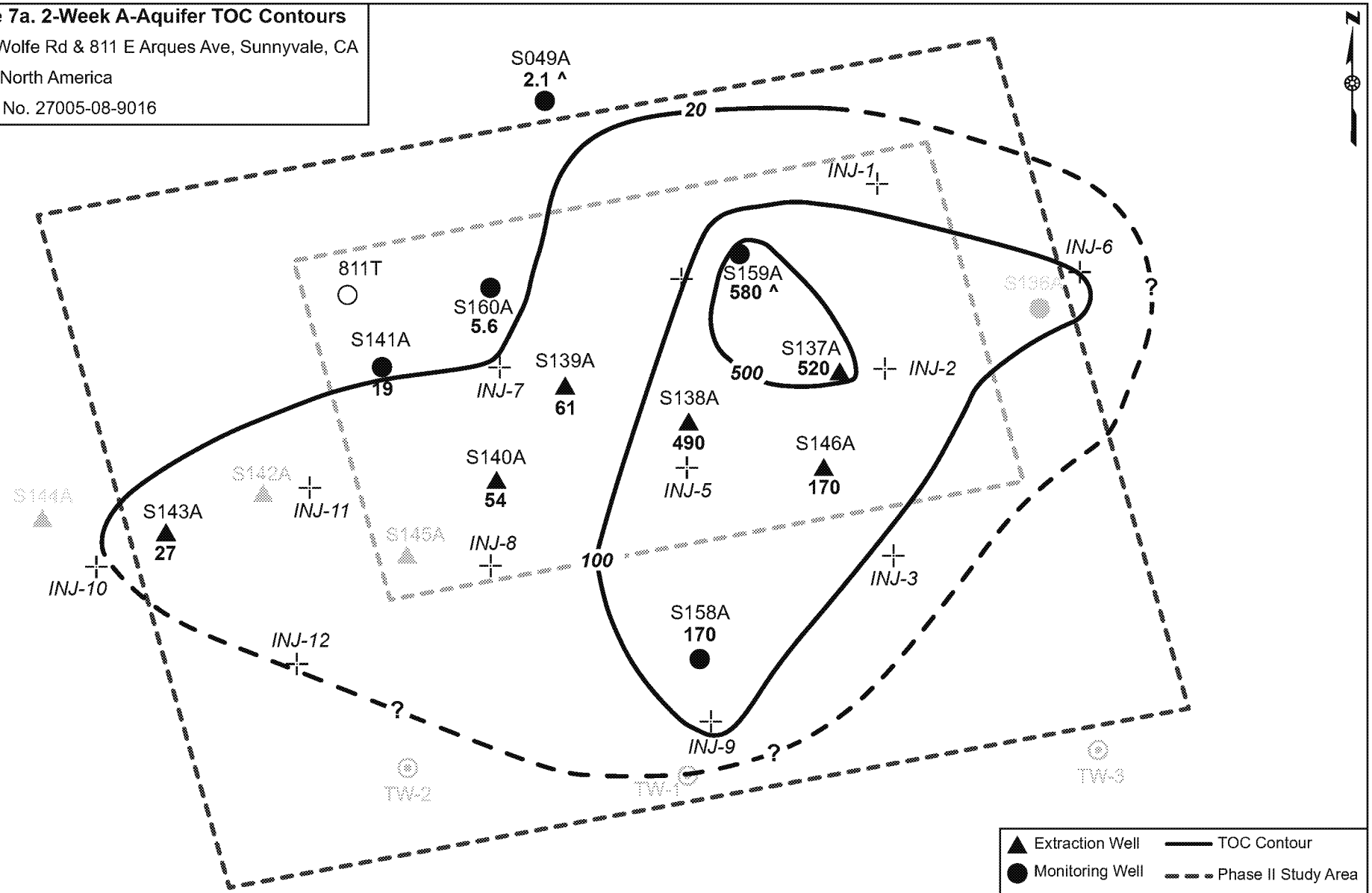
ED_013761_00000157-00182

Figure 7a. 2-Week A-Aquifer TOC Contours

440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA

Philips North America

Project No. 27005-08-9016



Extraction Well
Monitoring Well
Piezometer
Trench/Sump
Temporary Well
Injection Boring
TOC Contour
Phase II Study Area
Phase I Study Area
Extraction Trench

NOTES:
TOC concentrations are shown in **bold**.
All results are reported in mg/L.
Results are from samples collected on 11/20/2020.
^ = Instrument related QC is outside acceptance limits.

Rev. 2

DWN BY: JG | CKD BY: AE | APD: JWH

0 25 ft

1:314

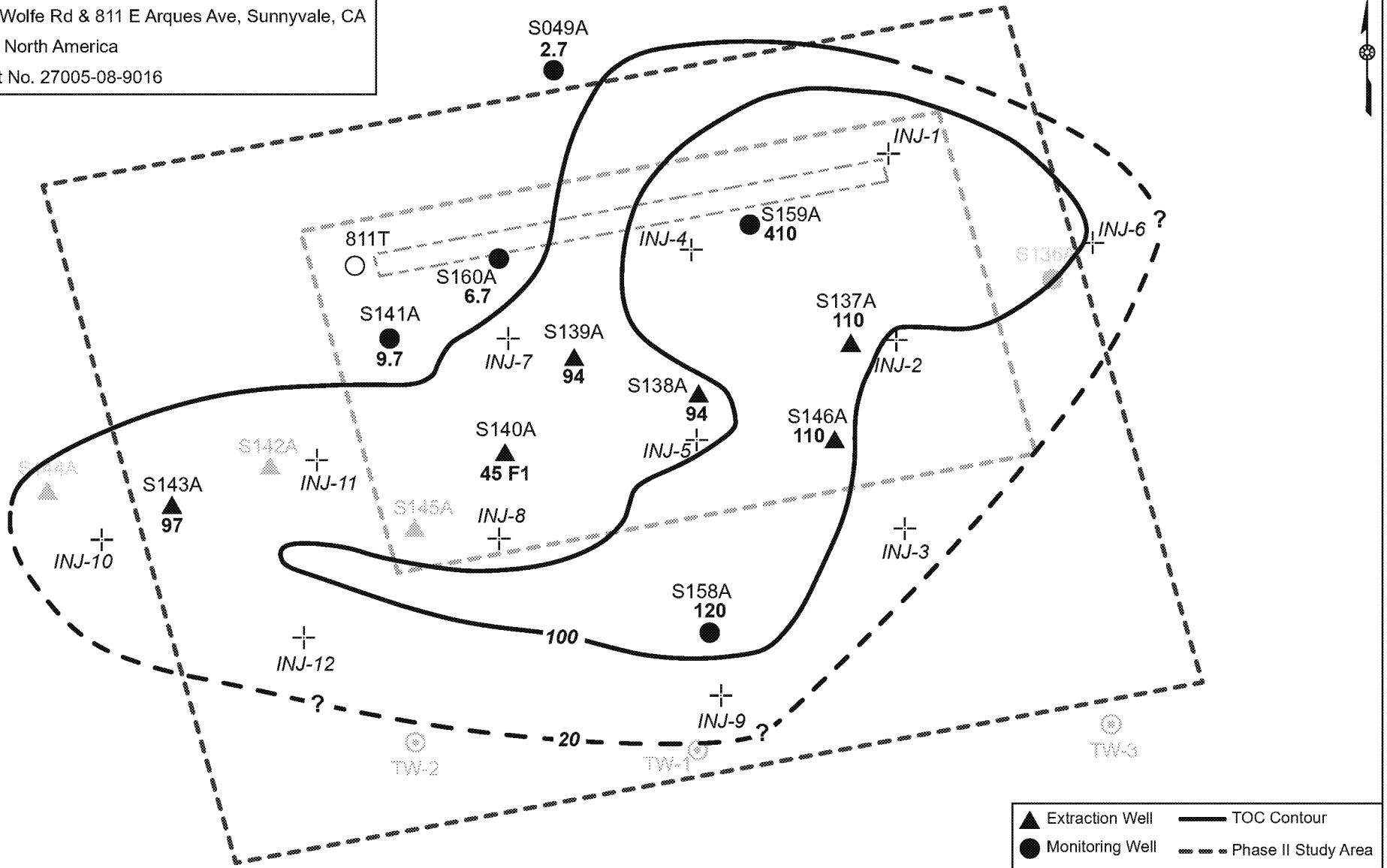
Locus Technologies

Figure 7b. 1-Month A-Aquifer TOC Contours

440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA

Philips North America

Project No. 27005-08-9016



Extraction Well

Monitoring Well

Piezometer

Trench/Sump

Temporary Well

Injection Boring

TOC Contour

Phase II Study Area

Phase I Study Area

Extraction Trench

NOTES:
TOC concentrations are shown in **bold**.
All results are reported in mg/L.
Results are from samples collected on 12/15/2020 to 12/18/2020.
F1 = MS and/or MSD recovery exceeds control limits.

Rev. 2

DWN BY: JG | CKD BY: AE | APD: JWH

0 25 ft

1:314

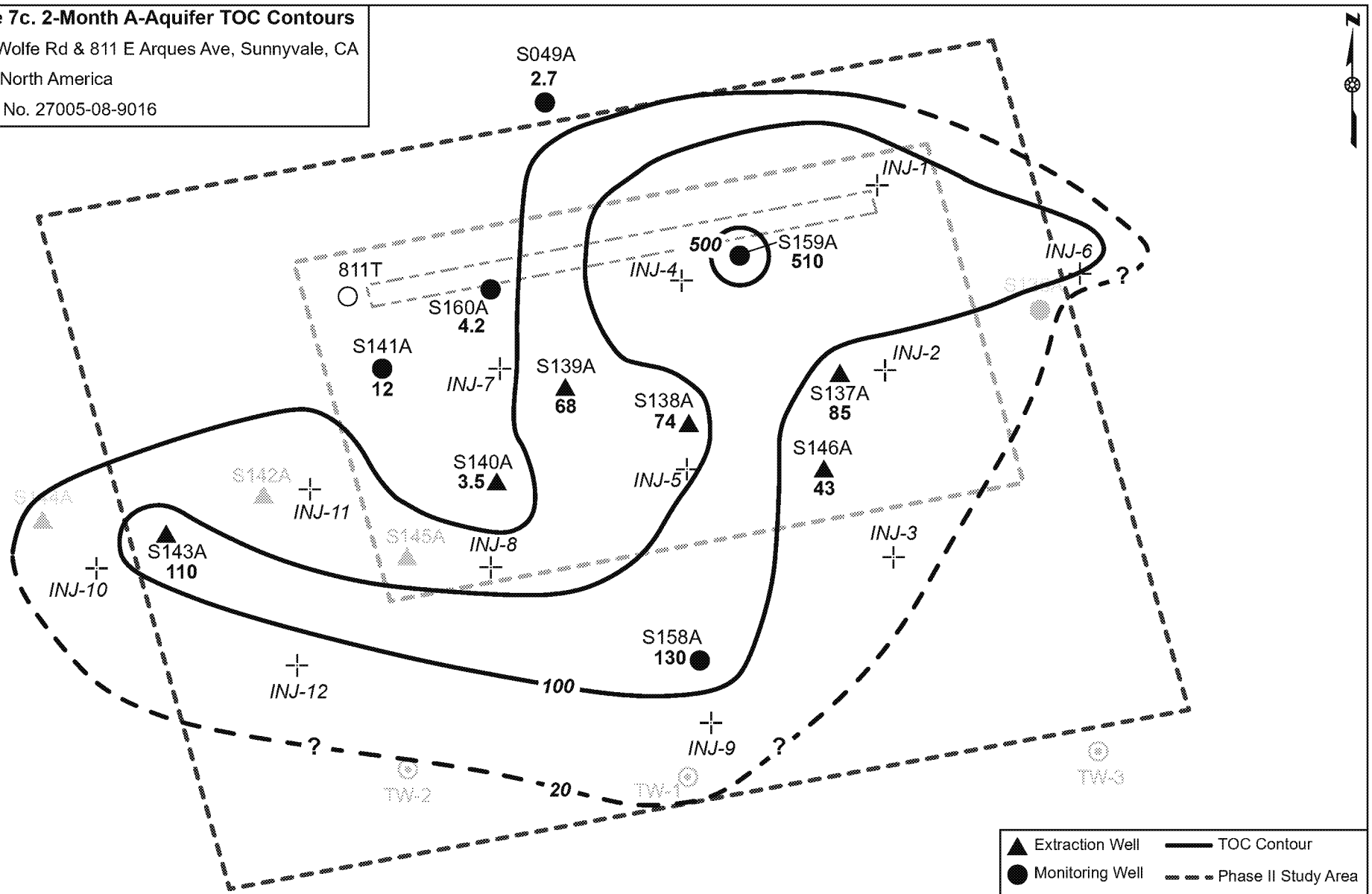
Locus TECHNOLOGIES

Figure 7c. 2-Month A-Aquifer TOC Contours

440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA

Philips North America

Project No. 27005-08-9016



NOTES:
TOC concentrations are shown in **bold**.
All results are reported in mg/L.
Results are from samples collected on 1/18/2021 to 1/20/2021 .
F1 = MS and/or MSD recovery exceeds control limits.

Rev. 2

DWN BY: JG | CKD BY: AE | APD: JWH

0 25 ft

1:314

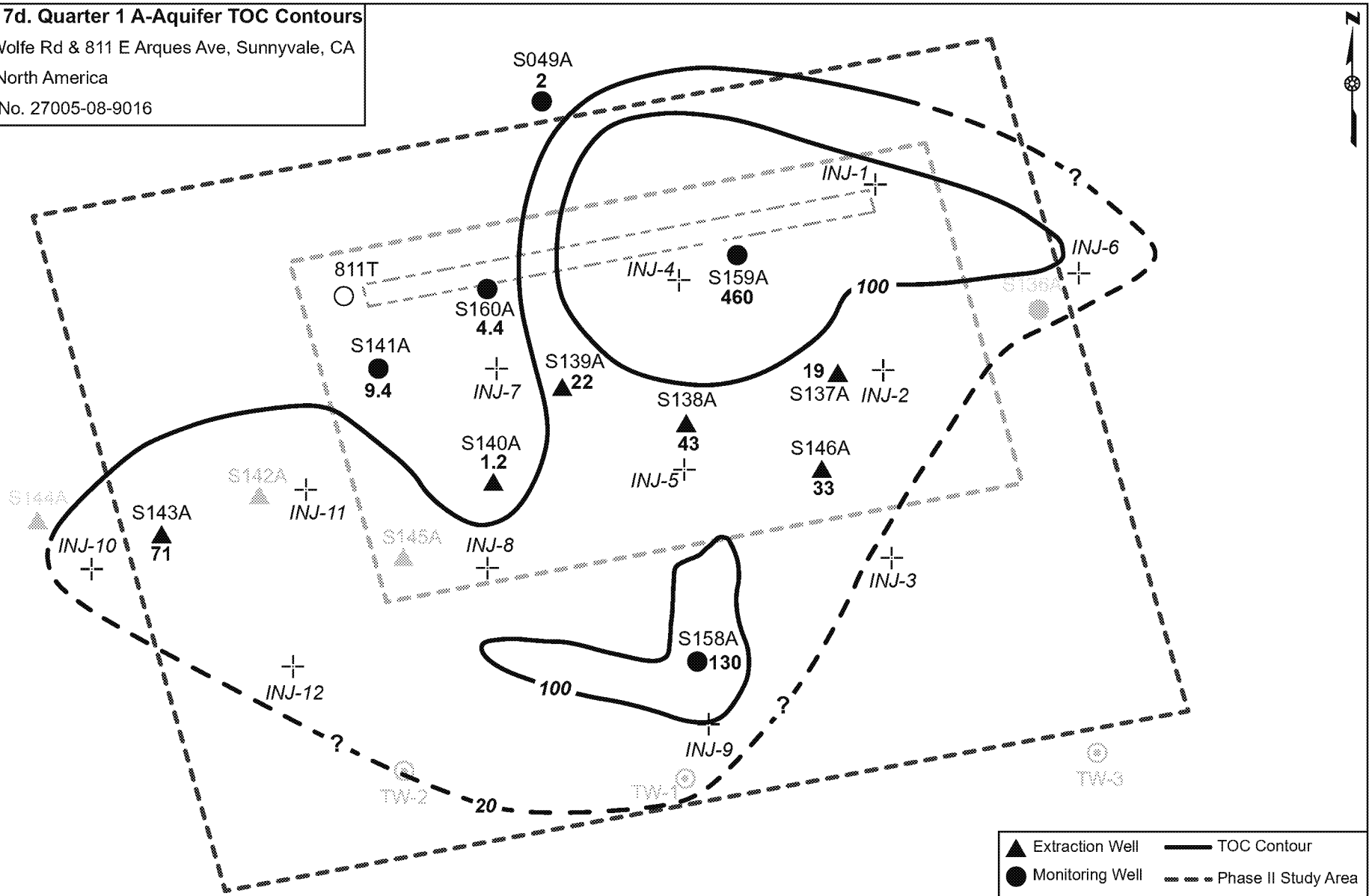
Locus TECHNOLOGIES

Figure 7d. Quarter 1 A-Aquifer TOC Contours

440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA

Philips North America

Project No. 27005-08-9016



Extraction Well
Monitoring Well
Piezometer
Trench/Sump
Temporary Well
Injection Boring
TOC Contour
Phase II Study Area
Phase I Study Area
Extraction Trench

NOTES:
TOC concentrations are shown in **bold**.
All results are reported in mg/L.
Results are from samples collected on 2/15/2021 to 2/17/2021.

Rev. 2

DWN BY: JG | CKD BY: AE | APD: JWH

0 25 ft

1:314

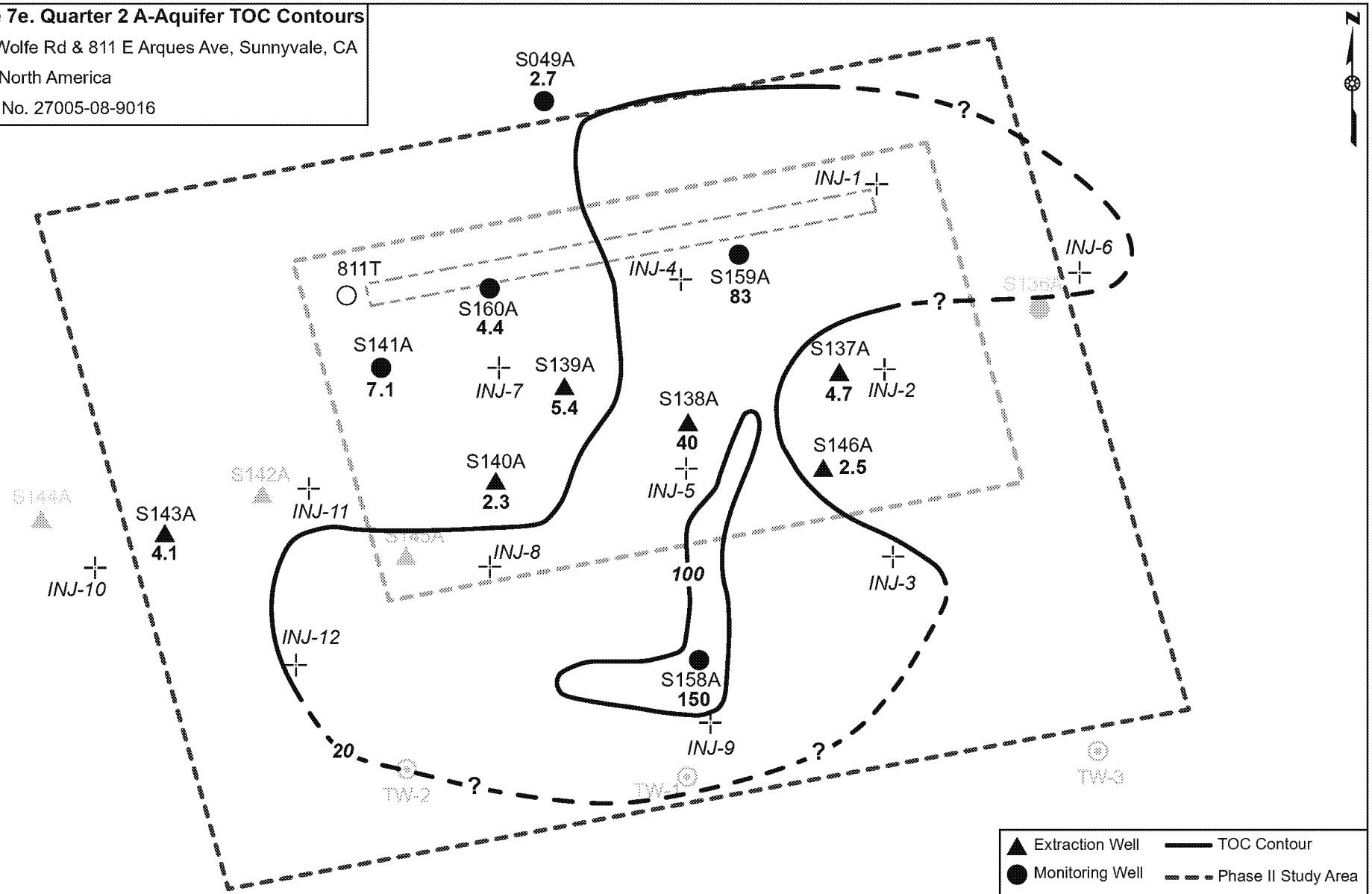
Locus TECHNOLOGIES

Figure 7e. Quarter 2 A-Aquifer TOC Contours

440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA

Philips North America

Project No. 27005-08-9016



NOTES:
TOC concentrations are shown in **bold**.
All results are reported in mg/L.
Results are from samples collected on 5/17/2021 to 5/19/2021.

Rev. 2

DWN BY: JG | CKD BY: AE | APD: JWH

0 25 ft

1:314

Locus TECHNOLOGIES

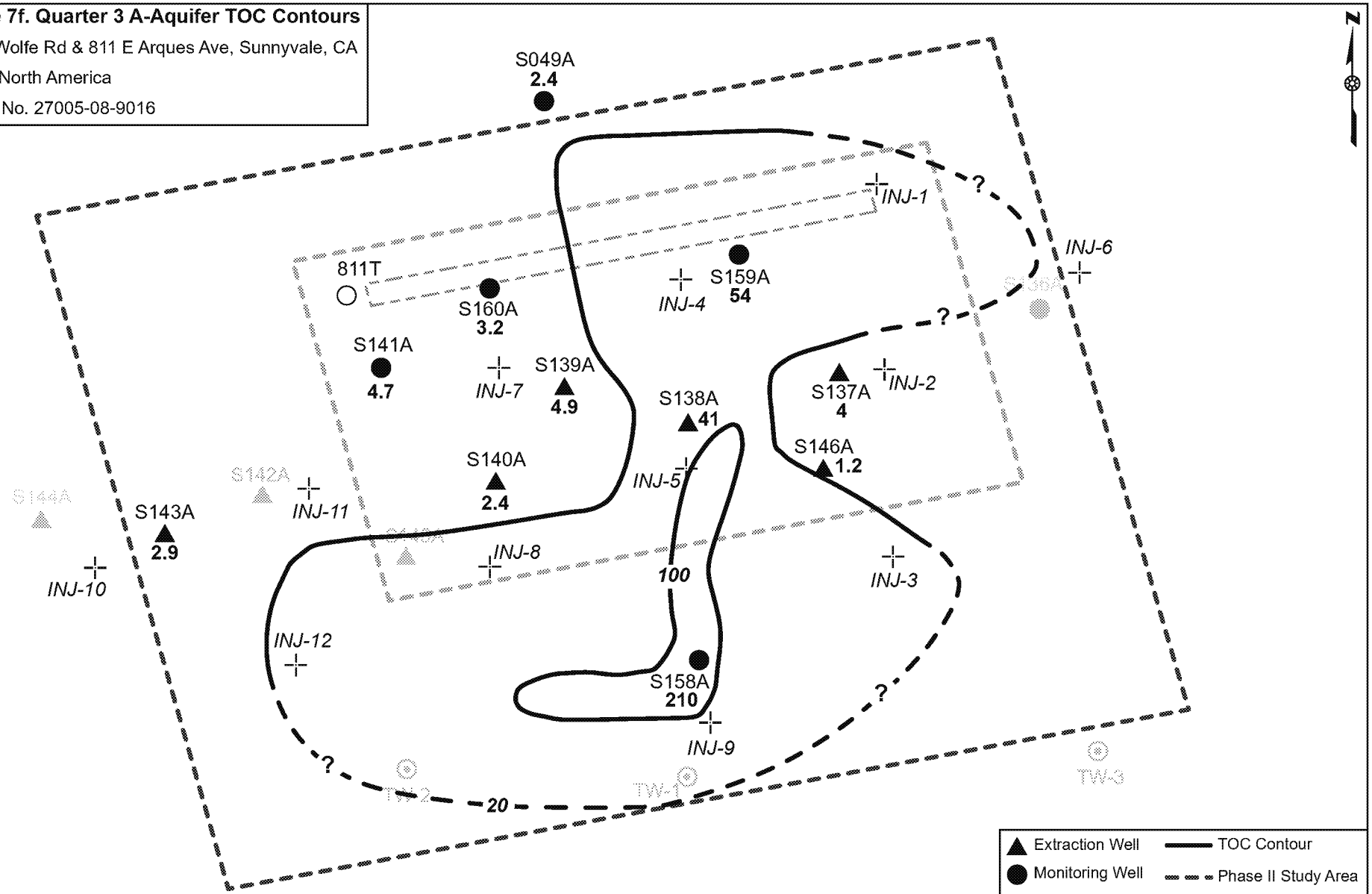
ED_013761_00000157-00187

Figure 7f. Quarter 3 A-Aquifer TOC Contours

440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA

Philips North America

Project No. 27005-08-9016



Extraction Well
Monitoring Well
Piezometer
Trench/Sump
Temporary Well
Injection Boring
TOC Contour
Phase II Study Area
Phase I Study Area
Extraction Trench

NOTES:
TOC concentrations are shown in **bold**.
All results are reported in mg/L.
Results are from samples collected on 8/17/2021 to 8/21/2021.

Rev. 2

DWN BY: JG | CKD BY: AE | APD: JWH

0 25 ft

1:314

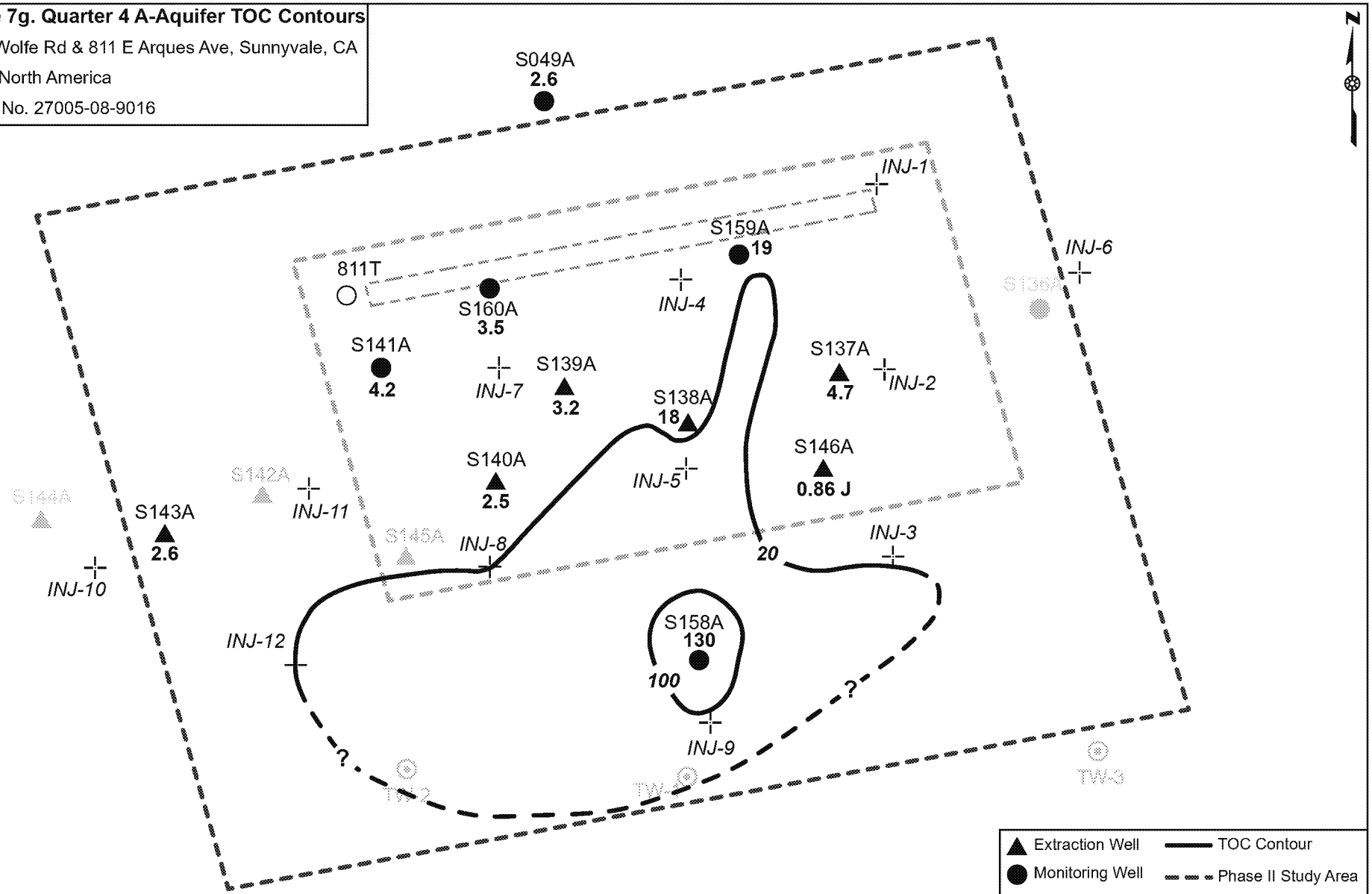
Locus TECHNOLOGIES

Figure 7g. Quarter 4 A-Aquifer TOC Contours

440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA

Philips North America

Project No. 27005-08-9016



Extraction Well
Monitoring Well
Piezometer
Trench/Sump
Temporary Well
Injection Boring
TOC Contour
Phase II Study Area
Phase I Study Area
Extraction Trench

NOTES:
TOC concentrations are shown in **bold**.
All results are reported in mg/L.
Results are from samples collected on 11/8/2021 to 11/10/2021. J = Result is less than the RL but greater than or equal to the MDL.

Rev. 2

DWN BY: JG | CKD BY: AE | APD: JWH

0 25 ft

1:314

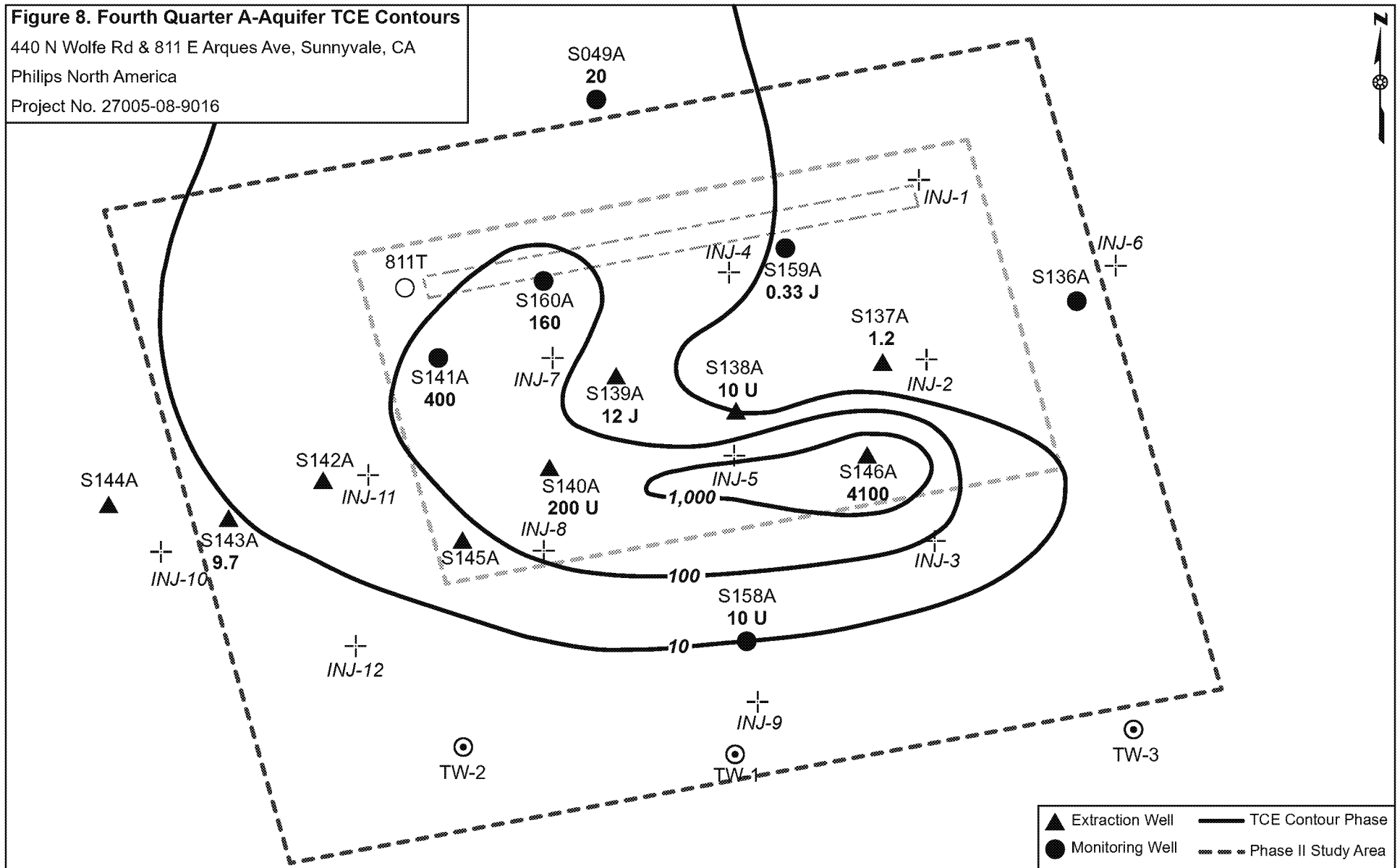
Locus TECHNOLOGIES

Figure 8. Fourth Quarter A-Aquifer TCE Contours

440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA

Philips North America

Project No. 27005-08-9016



NOTES:
TCE concentrations are shown in **bold**.
All results are reported in µg/L.
Fourth quarter sampling occurred from 11/8/2021 to 11/10/2021.
TW borings were backfilled on 11/20/2021, after grab samples were collected.

Rev. 2

DWN BY: JG | CKD BY: AE | APD: JWH

0 25 ft

1:314

Locus TECHNOLOGIES

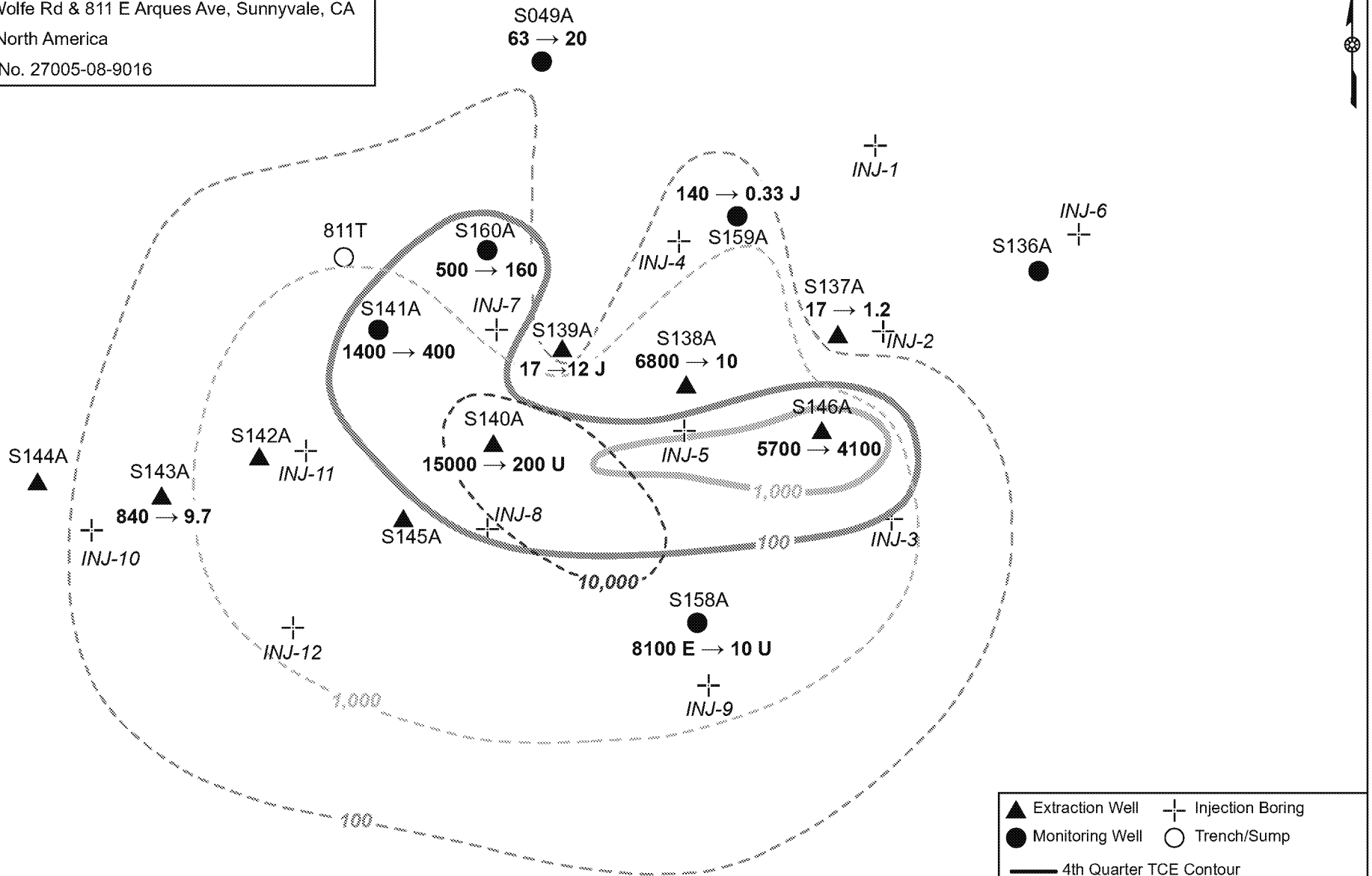
ED_013761_00000157-00190

Figure 9. Change in A-Aquifer TCE Contours

440 N Wolfe Rd & 811 E Arques Ave, Sunnyvale, CA

Philips North America

Project No. 27005-08-9016



NOTES:

TCE concentrations are shown in **bold** in the following format:
Baseline TCE Result → Fourth Quarter TCE Result
All results are reported in µg/L.
Baseline sampling occurred from 9/14/2020 to 9/16/2020. Fourth quarter sampling occurred from 11/8/2021 to 11/10/2021.
E - Result exceeded calibration range
J - Result is less than the RL but greater than or equal to the MDL
U - Analyte not detected.

Rev. 1

DWN BY: JG | CKD BY: AE | APD: JWH

0 25 ft

1:314

Locus TECHNOLOGIES

APPENDIX A

FIELD LOGS: WELL CONSTRUCTION, INJECTATE DELIVERY AND FIELD OBSERVATIONS

(AVAILABLE AS A SEPARATE VOLUME)

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APPENDIX B

INJECTION PERIOD GROUDNWATER LEVEL PLOTS

(AVAILABLE AS A SEPARATE VOLUME)

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APPENDIX C

POST-INJECTION MONITORING LOGS

(AVAILABLE AS A SEPARATE VOLUME)

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APPENDIX D

POST-INJECTION LABORATORY ANALYSIS REPORTS

(EUROFINS TEST AMERICA, PACE ANALYTICAL,

ENTHALPY AND MICROBIAL INSIGHTS)

(AVAILABLE AS A SEPARATE VOLUME)

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APPENDIX E

SOIL VAPOR METHANE MONITORING LOGS

(AVAILABLE AS A SEPARATE VOLUME)

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APPENDIX F

SOIL VAPOR LABORATORY ANALYSIS REPORTS

(AVAILABLE AS A SEPARATE VOLUME)

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APPENDIX G

QA/QC RESULTS ANALYSIS

(AVAILABLE AS A SEPARATE VOLUME)

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APPENDIX H

CONCENTRATION TRENDS PLOTS

(AVAILABLE AS A SEPARATE VOLUME)

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APPENDIX I

ADDITIONAL GROUNDWATER VELOCITY INVESTIGATION WELL DATA LOGS

(AVAILABLE AS A SEPARATE VOLUME)

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